Review Article

Traditional and Phytochemical Bases of Herbs, Shrubs, Climbers, and Trees from Ethiopia for Their Anticancer Response

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Ethiopia is one of Africa’s six plant-rich countries, with around 60% of the plants being indigenous and most of them having medicinal properties. 80% of people in the country use these plants as a primary health care system to tackle different diseases, including cancer. This review is aimed at summarizing the evidence gained from diverse MPs in Ethiopia that have been used ethnobotanically and ethnopharmacologically for treatment of cancer. The primary data sources were Google Scholar, Web of Science, Science Direct, Scopus, PubMed, and other electronic scientific databases. This literature review showed that there are around 200 MPs used as anticancer. Seventy-four herbs, 39 trees, 77 shrubs, and 17 weed/climbers belonging to 56 families have been identified for their ethnobotanical anticancer potential, and 31 species were recognized for their pharmaceutically anticancer activities. The reviewed data also indicated that many Ethiopian MPs had been used to treat breast, lung, blood, and skin cancers and other tumors. Besides, the collected data showed that the leaves (36.76%), roots (27.2%), bark (12.5%), stem (5.1%), and fruit (7.35%) of plants are commonly used for the preparation of anticancer remedies. Among the reported plant species, Euphorbiaceae (10.71%), Acanthaceae (7.14%), and Asteraceae (7.1%) are the most prominent plant families being used to treat cancer ethnobotanically. Phytochemicals such as flavonoids (like xanthone, indirubin, flavopiridol, and silybin), alkaloids (like taxol, vincristine, evodiamine, and berberine), and physalin B, D, and F steroids exhibited anticancer activity on various cancer cell lines. The crude extracts of Aerva javanica, Vernonia leopoldii, Withania somnifera, Kniphofia foliosa, and Catharanthus roseus were powerful anticancer agents with an IC50 value below 10 μg/mL. Although several Ethiopian plants possess anticancer potential, only a limited number of plants are scientifically studied. Therefore, more scientific studies on anticancer MPs should be carried out; it may lead to discovering and isolating cost-effective and safe anticancer drugs.

1. Background

Plants are the sources of different chemical constituents such as essential oils, seed oils, and other phytochemicals, which gives a potential for various applications and pharmaceutical uses [1–4]. Specifically, traditional MPs (TMs) keep us healthy and treat different illnesses [5]. People have used TMs as primary health care contributors for thousands of years, and they play a vital role in preventing many diseases in resource-limited areas of developing countries [6, 7]. Nowadays, more attention has been given to TMs by different researchers because they can generate many uses and applications in the line of medicine and pharmacy [8]. In China, from total medicinal consumption, about 30% to 50% was gained from medicinal plants (MPs) [9]. In India, there are 17,500 native plant species from these 7,500 species that are used in ethnomedicines. About 2,000 aromatic and medicinal plant species are commercially used in Europe, while over 5,000 plant species are estimated to be used for medicinal purposes in Africa [10]. In Mali, Ghana, Nigeria, and Zambia, 60% of children’s first treatment is obtained from a medicinal plant. In Ethiopia, approximately 80% of
the population uses MPs because of the cultural suitability for local medicine [9].

Ethiopia has a vast diversity of plant species due to the presence of various topographical settings, ranging from the highest mountain to a deep valley; as a result, Ethiopia is rich in MPs [11]. There are about 6,000 plant species in the country, with 12 percent of them being endemic [12]. In Ethiopia, more than 800 plant species have been claimed to treat more than 300 ailments [13]. The bioactive compounds are responsible for the pharmaceutical properties of MPs [14] and can be isolated from plant seeds, fruits, bark, leaves, stems, roots, and flowers [15]. Alkaloids, terpenoids, flavonoids, glycosides, and polyphenols are bioactive compounds obtained from MPs and are used to cure various diseases, including cancer [16].

Nowadays, cancer is one of the deadliest diseases in the world, which has been estimated to cause 9.9 million deaths in 2020 [17]. It also becomes a health problem in Ethiopia [18]. According to the report of Woldu et al. [19], each year, there are more than 150,000 cancer cases reported in the country; from these, about 4% result to deaths. The data obtained from the WHO indicated many types of cancers in Ethiopia; some of them are blood cancer, lung cancer, skin cancer, breast cancer, etc. [20]. Local people of Ethiopia have used different traditional practices to treat cancer [21]. MPs have been highly demanded in Ethiopia to treat cancer disease, because of their relatively low cost, the trust of communities on medicinal values of TMs being high, inadequate health centers, and shortage of drugs and personnel in clinics [13]. Some of the frequently cited anticancer MPs used by Ethiopian people to treat different types of cancers are Aerva javanica, Bersama abyssinica, Asparagus africanus, Brucea antidysenterica [22], Nigella sativa [23], Matricaria chamomilla, Foeniculum vulgare [24], Zingiber officinale, Hibiscus sabdariffa, Glinus lotoides, Mentha piperita, Trachyspermum Ammi [25], Lepidium sativum [26], Commiphora myrrha [27], Ruta chalepensis [28], and Lippia adenos [29] as illustrated in Figure 1.

Although several Ethiopian plants were known to possess anticancer activity, very little scientific research is carried out on these MPs [30]. Also, a limited number of classes of secondary metabolites and pure isolated compounds were tested against cancer cell lines. Insufficient documentation on the ethnobotanical use of anticancer MPs is another problem in sharing traditional medicinal knowledge [31]. This review is aimed at giving an overview of the ethnomedicinal and phytochemical bases of anticancer MPs of Ethiopia.

### 2. Methods

Published research papers, review papers, proceedings, short communications, and book chapters on different MPs used to treat various forms of cancer in Ethiopia were retrieved from multiple databases such as PubMed, Web of Science, Scopus, and Google Scholar. More than 100 publications were obtained from 2007 to 2020. In the search process, keywords phytochemistry of anticancer plants of Ethiopia, traditional anticancer medicinal plant of Ethiopia, MPs used against cancer/tumor in Ethiopia, herbal medicine traditional medicine used against cancer in Ethiopia, and bioactive compounds isolated from the anticancer medicinal plant of Ethiopia were used. We classified the data according to the type of cancer (breast cancer, lung cancer, blood cancer, and skin cancer) and medicinal plant habits (shrub, herb, tree, weed, and climber). Additional important papers were also examined based on the reference list of the retrieved documents. ChemDraw was used to draw the structure of bioactive compounds, and pie charts were prepared using Excel software, while Endnote performed reference writing. We use the Natural Products Database for Africa (NDA) to write the botanical name and the local name of the medicinal plant.

### 3. Cancer Status in Ethiopia

Ethiopia is Africa’s second-most populous country, and it is forecasted to become the world’s ninth most populous country by 2050, with a projected increase in cancer burden [32]. Cancer is expected to account for around 5.8% of total national mortality in Ethiopia. Except for Addis Ababa, where population-based statistics are available, it is estimated that the annual incidence of cancer is about 60,960 cases and the annual mortality is over 44,000 [33]. According to a World Health Organization report on cancer [34], 77,352 new cancer cases were reported in both sexes of all ages, of which 26,754 were male of all ages and 50,598 were female of all ages. This showed that the number of new female cancer cases is 89.8% higher than that of males. Some of the recorded new cancer cases in 2020 were breast cancer (20.9%), leukemia (5.6%), cervix uteri (9.6%), colorectum (3.6%), and non-Hodgkin lymphoma (4.9%) (Table 1), and the mortality rates in the specified year were 24.1% (breast), 16.0% (cervix uteri), 3.9% (leukemia), 5.5% (ovary), 3.6% (lung), 3.4% (stomach), 5.5% (colorectum), and 5.9% (prostate) [34]. According to Tuasha et al. [11], from the total medicinal plant consumption used to treat cancer, 44.33% accounts for neck cancer, 14.0% breast cancer, and 10.67% skin cancer. The rest are the cancer of the brain, bone, rectal, lung, anus, cervix, and others.

#### 3.1. Ethnobotanical Survey of MPs for Cancer Treatment.

MPs are essential part of human life. For more than 2,000 years, they have been used as alternative medicine in the world [11]. Approximately 80% of these MPs globally are essential as the primary healthcare for fighting infections and treating illness [35]. MPs have been in continuous use over the years to manage cancer, particularly in most developing countries of the world [36]. The bioactive compounds of phytochemicals present in MPs are used to treat different diseases, including cancer [37]. For example, around 60% of drugs necessary for the cancer cure system have been derived from natural products of MPs [38]. Aromatic MPs are also crucial for medicinal purposes; they were considered the “father of medicine” by Hippocrates and ancient Greek physicians. Treating cancer and AIDS/HIV are their main benefits [21].
Many medicinal plant species found in Ethiopia are used to treat different types of illnesses for many years. Because the society believes in the therapeutic value of traditional medicines, of health center insufficiency, of the relatively low costs, of culturally related traditions, and of shortages of clinics and medical personnel, they are very popular in Ethiopia [13]. In Ethiopia, a large number of the human population (80%) and livestock (90%) directly or indirectly depend on traditional medicine [39]. According to a study conducted on traditional MPs in Ethiopia, the frequently cited diseases treated by these plants were cancers/tumors, stomach aches, wounds, coughs, headaches, skin diseases, toothaches, and diarrhoea [13]. Different studies on the ethnobotanical use of MPs from other parts of the country showed that traditional MPs are widely practiced to treat various cancer diseases such as lung cancer, breast cancer, and skin cancer [11]. Because of its ease of access and cultural acceptance, cancer patients choose traditional MPs for therapeutic approaches [40]. Ethnobotanical practices to treat cancer in Ethiopia are listed in Table 2. Table 2 shows the list of 200 MPs which are used ethnobotanically against anticancer. Out of these, 33.8% are herbs, 17.9% trees, 39.5% shrubs, and 8.8% weed/climbers. Among the 56 families, Euphorbiaceae (10.71%), Acanthaceae (7.14%), and Asteraceae (7.1%) are the most prominent families which are used for ethnobotanical anticancer preparation. Regarding their distribution, 24% of MPs were found in Southern Nations, Nationalities, and People (SNNP), 21% in the Oromia region, and 20% in the Amhara regional state, as shown in Figure 2. The reviewed data also indicated that many Ethiopian MPs had been used to treat breast, lung, blood, and skin cancers. Plant sections that are widely

### Table 1: Number of new cancer cases in 2020 in Ethiopia in number and percentage [34].

| New cancer cases          | Both sexes of all ages | Males of all ages | Females of all ages |
|---------------------------|------------------------|-------------------|--------------------|
| Non-Hodgkin lymphoma      | 3,824 (4.9%)           | 2,359 (8.8%)      | 1,465 (2.9%)       |
| Leukemia                  | 4,361 (5.6%)           | 2,565 (9.6%)      | 1,796 (3.55%)      |
| Cervix uteri              | 7,455 (9.6%)           | —                 | 7,455 (14.7%)      |
| Breast                    | 16,133 (20.85%)        | —                 | 16,133 (31.9%)     |
| Colorectum                | 6,048 (7.8%)           | 3,121 (11.7%)     | 2,927 (5.8%)       |
| Prostate                  | 2,720 (3.51%)          | 2,720 (10.2%)     | —                  |
| Ovary                     | 2,655 (3.43%)          | —                 | 2,655 (5.2%)       |
| Other cancers             | 34,156 (44.15%)        | 15,989 (59.76%)   | 18,167 (35.9%)     |
| Total                     | 77,352                 | 26,754            | 50,598             |
Table 2: Ethnobotanical uses of anticancer plants in Ethiopia.

| Family               | Habitat | Plant name                  | Local name          | The region in which the plant can be found | Part of the plant used to treat cancer | Type of cancer | Ethnobotanical preparation                                                                 | Reference |
|----------------------|---------|-----------------------------|---------------------|------------------------------------------|--------------------------------------|----------------|-------------------------------------------------------------------------------------------|-----------|
| Acanthaceae          | H       | *Blepharis maderaspatensis* | Boke                | Harari region                           | Roots                                | Breast cancer  | The root is powdered and boiled with coffee used to like tea                               | [21]      |
| Acanthaceae          | S       | *Justicia schimperiana*     | Kitkit              | North bench in SNR                      | Roots                                | Lung cancer    | Until eating, fresh roots are crushed and boiled and the cool decoction is drank           | [40]      |
| Aloaceae             | S       | *Aloe pirottae*             | It                  | Sidama zone in SNNP                     | Leaves                               | NSC            | A spoonful of the plant’s pulp or leaf is mixed with honey and consumed twice a day       | [11]      |
| Aloaceae             | S       | *Aloe sp.*                  | Gurtawaqota         | Mizan Aman in SNNP                      | Leaves                               | NSC            | The sap, which is made from the fresh root, is applied to the affected area               | [30]      |
| Amaranthaceae        | H       | *Aerva javanica*            | Tobia               | Dek Island in Amhara region             | Roots                                | Breast cancer  | The plant root is powdered and combined with the bat's blood and given orally before breakfast in the morning | [41]      |
| Amaranthaceae        | H       | *Pupalia lappacea*          | Kent-omme           | Harari region                           | Leaves                               | NSC            | The leaves are boiled and pasted with edible oil and orally taken                         | [21]      |
| Amaranthaceae        | W       | *Achyranthes aspera*        | Koch-ashite         | Mizan Aman in SNNP                      | Leaves                               | NSC            | Animal butter mixed with leaves of the plant roasted on a metal plate, crushed into powder, and then applied on the affected part | [30]      |
| Amaryllidaceae       | H       | *Scadoxus multiflorus*      | Dem-astefit         | Mizan Aman in SNNP                      | Roots                                | NSC            | Combination with other herbs and applied topically                                      | [11]      |
| Amaryllidaceae       | H       | *Crinum abyssinicum*        | Yegibb shinkurt     | Dek Island in Amhara region             | Leaves                               | NSC            | The leaf powder is administered topically to the afflicted area, together with hyena excrement and latex, to provide progressive relief | [42]      |
| Anacardiaceae        | T       | *Ozora insignis*            | Rukeylu, Garri      | Harari region                           | Root                                 | NSC            | The plant's root has been crushed, and the bandage has been placed over it               | [21]      |
| Apiaceae             | H       | *Centella asiatica*         | Goro-ngoc           | Sheko in SNNPR                          | Leaves                               | NSC            | The young leaves of the plant are powdered, and the sap is sniffed                      | [30]      |
| Apiaceae             | H       | *Foeniculum vulgare*        | Ensilal             | East Gojjam in Amhara region            | Roots                                | Lung cancer    | The roots of the plant are mixed with other herbs used and taken orally                  | [30]      |
| Apiaceae             | H       | *Hydrocotyle mannii*        | Yeti-medhanit       | North bench in SNNPR                    | Leaves                               | NSC            | The leaves of the plant at a young age are powdered and put in the affected area        | [30]      |
| Apiaceae             | H       | *Ferula communis*           | Dog                 | Libo-Kemkem in Amhara region            | Root                                 | Lung cancer    | Fresh root crushed and drank with water orally                                         | [43]      |
| Apocynaceae          | H       | *Echidnopsis dammaniana*    | Murali              | Gene in Afar region                     | Stem                                 | NSC            | The stems of the plant are cut and the sap is introduced on the area of the affected part | [40]      |
| Apocynaceae          | H       | *Catharanthus roseus*       | Wulu-wusha          | Dawro in SNNPR                          | Aerial part                          | NSC            | Liver infection, wounds, and rheumatism                                                  | [44]      |
| Apocynaceae          | H       | *Huernia macrocarpa*        | Yemidirkulkual      | In all the Amhara region                | Latex                                | Skin cancer    | The wound part is treated by inserting the mixture of the latex of the plant with "sumanfar" | [45]      |
| Family        | Habitat | Plant name               | Local name | The region in which the plant can be found | Part of the plant used to treat cancer | Type of cancer | Ethnobotanical preparation                                                                 | Reference |
|--------------|---------|--------------------------|------------|-------------------------------------------|---------------------------------------|----------------|------------------------------------------------------------------------------------------|-----------|
| Apocynaceae  | S       | Carissa spinarum         | Agam       | Bahir Dar Zuria in Amhara region           | Twigs and leaves                      | Oral cancer    | Honey mixed with a paste made by crushing the young twig and fresh leaf of the plant. The mixture is given orally until a cure | [46]      |
| Apocynaceae  | S       | Calotropis procera       | Kobo       | Gene, in Afar region                       | Flower and root                       | NSC            | The sap is added to the region after fresh roots are crushed                            | [47, 40]  |
| Apocynaceae  | C       | Pentarrhinum insipidum   | Barohula   | Gewane in Afar region                      | Root                                  | NSC            | The plant’s fresh roots are pounded, and the sap is added to the affected region          | [30]      |
| Asclepiadaceae | H     | Caralluma speciosa       | Ya’iibera  | Harari region                             | Stem                                  | NSC            | The stem of the plant is crushed and bandaged in the affected part                       | [21]      |
| Asclepiadaceae | S     | Kanahia laniflora        | August     | Around West Gojjam in Amhara region        | Leaves and latex                      | NSC            | Fresh leaf juice with latex is taken orally or applied topically                          | [11]      |
| Asparagaceae | C/W     | Asparagus africanus      | Sarita, hidden saree | Harari region in eastern Ethiopia | Root                                  | Breast cancer  | The concoction taken orally to treat tumors                                               | [21]      |
| Asparagaceae | C/W     | Asparagus africanus      | Yes-kest   | Zegie Peninsula in Amhara regional state   | Roots                                 | Uterine cancer and breast cancer            | The root is pounded, boiled, and drank                                                  | [48]      |
| Asparagaceae | C/W     | Asparagus africanus      | Yes-kest   | Kembatta Tembar in SNNPR                  | Root                                  | Breast cancer  | Used to treat uterine prolapse and breast tumours, among other things                    | [38]      |
| Asphodelaceae | H      | Knipho fi a foliosa      | Shushube   | Bale Gobain Oromia region                 | Root                                  | NSC            | The dried roots are crushed and powdered and mixed with honey                            | [30]      |
| Aspleniacae  | S       | Artemisia absinthium     | Ariti      | None                                     | Leaves                                | NSC            | The leaves of the plant are mixed with Zingiber officinal and Ruta chalepensis, made into an infusion, filtered, and drank | [30]      |
| Asteraceae   | H       | Bidens macroptera        | Adey Abeba | Libo kemke district in Amhara region       | Flower                                | Brain cancer   | The powdered flower part is used                                                          | [43]      |
| Asteraceae   | H       | Bidens macroptera        | Adey Abeba | Libo Kemke in Amhara region               | Leaves                                | NSC            | The leaves are dried and powdered and applied to the area which needs to be cured       | [43]      |
| Asteraceae   | H       | Artemisia absinthium     | Natura     | Sodo Zuria in SNNP                        | Leaves                                | NSC            | Dried leaves of the plant are powdered and macerated in coffee or tea                    | [30]      |
| Asteraceae   | H       | Artemisia afra           | Agfa       | Doyo Gena in SNNPR                        | Leaves                                | NSC            | Juice squeezed and taken orally                                                          | [30]      |
| Asteraceae   | H       | Cineraria abyssinica     | Item-firh  | Bale Robe in Oromia region                | Leaf and aerial parts                | NSC            | The aqueous decoction of the aerial and leaf parts of the plant is taken orally          | [48]      |
| Asteraceae   | T       | Bacchae-oides filigera   | Weynagift  | Item-firh Oromia region                   | Leaves                                | NSC            | Decocted leaf is drank to recover from lines                                             | [30]      |
| Family    | Habitat | Plant name                  | Local name           | The region in which the plant can be found | Part of the plant used to treat cancer | Type of cancer | Ethnobotanical preparation                                                                                           | Reference |
|-----------|---------|------------------------------|----------------------|-------------------------------------------|--------------------------------------|----------------|----------------------------------------------------------------------------------------------------------------------|-----------|
| Asteraceae| H       | *Artemisia annua*            | Artemisia            | Nekem and Jimma in Oromia region          | Leaves                               | NSC            | Dried leaves are powdered and decocted in hot water and taken                                                     | [30]      |
| Asteraceae| T       | *Vernonia auriculifera*      | Barawa               | Sodo Zuria in Sidama regional state       | Leaves                               | Skin cancer    | The leaves of the plant in a fresh state are grounded, and the sap is applied to it                               | [22]      |
| Asteraceae| T       | *Vernonia auriculifera*      | Reji                 | Wondo Genet in SNNP                      | Leaves                               | Skin cancer    | The plant’s leaves in a fresh state are grounded, and the sap is applied to it                                   | [22]      |
| Asteraceae| S       | *Echinops jericho*           | Kericho              | Harari region                            | Root                                 | NSC            | Powdered with *Hydorea johnis* tuber and added in the food that we eat                                            | [21]      |
| Asteraceae| H       | *Guizotia scabra*            | Sodo Zuria           | Doyo Gena in Sidama regional state        | Leaves                               | NSC            | The sap from fresh leaves is added to the affected area after they have been crushed                               | [30]      |
| Asteraceae| S       | *Vernonia auriculifera*      | Barawa               | Reji in SNNPR                            | Leaves                               | NSC            | The sap, made from fresh leaves of the plant, is crushed, and the sap is applied                                 | [30]      |
| Asteraceae| S       | *Solanecio gigas*            | Ababa                | Doyo Gena in SNNPR                       | Leaves                               | NSC            | The sap from fresh leaves is added to the affected area after they have been crushed                               | [30]      |
| Asteraceae| W       | *Plectocephalus varians*     | Est窸-Yohannes       | Around West Gojjam in Amhara region       | Whole part                           | NSC            | The entire fresh plant is squeezed and applied                                                                     | [11]      |
| Asteraceae| S       | *Vernonia amygdalina*        | Grawa                | Sidama regional state                    | Shoot                                | NSC            | Tender shoots are pounded and soaked with water and given to the patient                                          | [13]      |
| Boraginaceae| T    | *Cordia africana*            | Size                 | South Gonder in Amhara region            | Leaves                               | NS            | The juice is made from the leaves of the plant and its paste is used to treat cancer                               | [46]      |
| Boraginaceae| T    | *Ehretia cymosi*             | Makeba               | Across the region of Ethiopia            | Bark                                 | Nectar and anal cancer | The root bark is applied topically in conjunction with other herbs                                                  | [11]      |
| Brassicaceae| H   | *Brassica carinata*          | Gome-nzer            | Debark district in Amhara region          | Seed                                 | Skin cancer    | Seed of the plant with leaf and seed of the plant alone are crushed, powdered, and mixed with honey and creamed on the affected area | [49]      |
| Capparidaceae| H  | *Cleome brachycarpa*         | Berbere              | Gene in Afar regional state              | Leaves                               | NSC            | Fresh leaves of the plant are grounded, and the sap is placed on the affected part                               | [30]      |
| Capparidaceae| T  | *Boscia senegalensis*        | None                 | None                                    | Root                                 | NSC            | By pounding and powdering given orally                                                                            | [50]      |
| Capparidaceae| S  | *Canada farinosa*            | Qala-anqaal          | Yalo district, zone 4 in Afar region      | Leaves                               | Breast cancer  | Not found                                                                                                           | [51]      |
| Family     | Habitat | Plant name               | Local name | The region in which the plant can be found | Part of the plant used to treat cancer | Type of cancer          | Ethnobotanical preparation                                                                 | Reference |
|------------|---------|--------------------------|------------|--------------------------------------------|--------------------------------------|-------------------------|---------------------------------------------------------------------------------------------|-----------|
| Celastraceae | S/T     | *Maytenus senegalensis*  | Kebkeb     | Gondar Zuria district in Amhara region      | Bark                                 | NSC                     | The plant’s bark is crushed, boiled, and filtered, and one cup is served                   | [52]      |
| Celastraceae | S       | *Maytenus ovatus*        | Not specified | NA                                            | Leaf                                 | NSC                     | The plant’s leaf paste, mixed with honey, is taken orally every morning and evening before it heals | [53]      |
| Celastraceae | S       | *Gymnosporia Buchanan*   | Atat       | Gondar in Amhara region                      | Leaves                               | NSC                     | Crushed leaves are mixed with honey to produce a paste                                    | [54]      |
| Celastraceae | S       | *Maytenus senegalensis*  | Atat       | Gondar Zuria district, Amhara region         | Leaves                               | NSC                     | It is applied to the affected region with a paste                                        | [52]      |
| Combretaceae | T       | *Lagenaria siceraria*    | Basubaaqula| Dega Damot district/Amhara region            | Fruit                                | Breast cancer           | The leaves of the plant are powdered, squeezed, and put on the affected area (wound)     | [55]      |
| Combretaceae | T       | *Combretum collinum*     | Abalo      | Debark district, North Gondar zone in Amhara region | Leaves                               | NSC                     | The leaves of the plant are grounded, crushed, and put on the wound or tumour            | [11]      |
| Commelinaceae | H      | *Commelina benghalensis* | Value-cha  | Doyo Gena in SNMP                            | Roots                                | NSC                     | Fresh roots of the plant are dried and pounded, and the sap is put on the affected part | [30]      |
| Convolvulaceae | S       | *Ipomoea marmorata*      | Gumna-kul  | Harari region in eastern Ethiopia            | Root                                 | NSC                     | The new tuber is consumed, and a concoction is taken orally                               | [21]      |
| Crassulaceae  | H       | *Kalanchoe petson*       | Inda-hula  | Bale in Oromia region                        | Leaves                               | Breast cancer and skin cancer | The plant leaves, fresh, are soaked for two minutes and put on the affected part. The plant is powder and mixed with hyena faces and latex | [22]      |
| Crassulaceae  | H       | *Kalanchoe lanceolata*   | Bose       | Nekemte in Oromia region                     | Leaves and roots                     | NSC                     | The juice which is made from the fresh root and leaves is squeezed and drank             | [56]      |
| Cucurbitaceae | H       | *Cucumis prophetarum*    | Yemdirembuay | Across the region of Ethiopia                | Roots                                | Skin cancer             | The root of the plant is dried and powdered and, when combined with water, given orally | [42]      |
| Cucurbitaceae | H       | *Clutia abyssinica*      | File-fej    | Across the region of Ethiopia                | Whole part                           | NSC                     | The whole part of the plant, together with *Coffee robusta* and *Coffee richardiana*, is used topically | [11]      |
| Cucurbitaceae | H       | *Momordica friesorum*    | Wof tech   | Across the region of Ethiopia                | Roots                                | NSC                     | The root of the plant is combined with other herbs and applied topically                  | [11]      |
| Cucurbitaceae | T       | *Croton macrostachyus*   | Bisana     | Hawassa, Sidama regional state              | Leaves                               | Skin cancer and wound cancer | The juice of the leaves of the plant and its paste are applied on wound cancer, and crushed and powdered fresh leaves are used on the affected part | [46, 30] |
| Family        | Habitat | Plant name                  | Local name | The region in which the plant can be found | Part of the plant used to treat cancer | Type of cancer | Ethnobotanical preparation                                                                                      | Reference |
|---------------|---------|-----------------------------|------------|-------------------------------------------|---------------------------------------|----------------|------------------------------------------------------------------------------------------------------------------|-----------|
| Cucurbitaceae | W/C     | *Lagenaria siceraria*       | Qil        | Hawassa city/ Sidama regional state       | Root                                  | NSC            | The root of the plant is pounded, powdered, and drank                                                            | [39]      |
| Cucurbitaceae | W/C     | *Lagenaria siceraria*       | Qil        | None                                      | Leaves                                | NSC            | Crushed and squeezed leaves are applied to the infected area to alleviate cancerous sores                       | [57]      |
| Euphorbiaceae | T       | *Euphorbia tirucalli*       | Kinc hib   | South Wollo in Amhara regional state       | Latex of roots                         | Skin cancer    | The fresh sap/latex of the plant is collected and creamed all over the body. Latex is given for topical application | [58]      |
| Euphorbiaceae | H       | *Euphorbia platyphyllus*    | Anitrfa    | Mecha district in Amhara region           | Latex                                  | NSC            | Fresh latex of the plant is put topically on the tumour                                                        | [22]      |
| Euphorbiaceae | H       | *Euphorbia lathyris*        | Hada-amii  | Chelya district in Oromia region           | Stem                                   | Breast cancer  | Steam of the plant is chopped and fumigated to the affected breast                                              | [22]      |
| Euphorbiaceae | T       | *Euphorbia abyssinica*      | Cultural   | Around Debre Libanos in Oromia region     | Latex                                  | Skin cancer    | Latex is eaten with teff powder of the plant bread or takes the latex and then painted on the spot                | [45]      |
| Euphorbiaceae | T       | *Acacia oerfota*            | Seraw      | Yalo district zone 4 in Arar region        | Leaves                                | Breast cancer  | The leaf of the plant is crushed and put nasally and topically                                                 | [11]      |
| Euphorbiaceae | T       | *Euphorbia abyssinica*      | Qulqwal    | Debre Libanos in Oromia region            | Latex, stem, and bark                  | Skin cancer    | Decoction and placing of the latex to the affected part; and the paste of the bark and stem is rub to the affected area | [42]      |
| Euphorbiaceae | T       | *Euphorbia tirucalli*       | Kinship    | Dale district in Sidama regional state    | Bark                                  | Skin cancer    | Latex is combined with powder made from beans given to eat after food, and latex is dropped on the affected part to treat skin cancer | [58]      |
| Euphorbiaceae | T       | *Euphorbia tirucalli*       | Kinship    | Fiche in Oromia region                    | Latex and root                         | Skin and neck cancers | Eaten and added to the skin after being mixed with bean powder                                               | [59]      |
| Euphorbiaceae | T       | *Erythrina brucei*          | Kiara/Woolens | Dale district in Sidama region            | Bark                                  | NSC            | The juice made from the bark of the plant is drank for the treatment of cancer                                | [46]      |
| Euphorbiaceae | T       | *Croton macrostachyus*      | Bisana     | Hawass in Sidama region                   | Leaves and seeds                       | NSC            | The leaves or the seed of the plant are crushed and inserted into the wound                                    | [45]      |
| Euphorbiaceae | S       | *Ricinus communis*          | Qenbo’o     | Hawassa in Sidama region                  | Root                                  | Breast cancer  | The root of the plant is chewed and swallowed or applied to the affected part                                  | [30]      |
| Euphorbiaceae | S       | *Colutea abyssinica*        | Graduate   | Across the region of Ethiopia              | Root and seed                          | Cervical and rectal cancer | The root and seed are mixed with other herbs and given topically                                              | [11]      |
| Euphorbiaceae | S       | *Jatropha curcas*           | Ayderke    | NA                                       | Seed                                  | NSC            | Tumours are treated with a paste made from the plant seed powder mixed with honey                               | [44]      |
| Family          | Habitat | Plant name          | Local name                   | The region in which the plant can be found | Part of the plant used to treat cancer | Type of cancer | Ethnobotanical preparation                                                                 | Reference |
|-----------------|---------|---------------------|-------------------------------|-------------------------------------------|----------------------------------------|----------------|---------------------------------------------------------------------------------------------|-----------|
| Euphorbiaceae   | T       | Acalypha acrogyna   | Gullo                         | Gondar in Amhara region                   | Leaves                                 | NSC            | The leaves of the plant are crushed and combined with honey                                  | [60]      |
| Euphorbiaceae   | T       | Acalypha acrogyna   | Gullo                         | Gondar in Amhara region                   | Leaves                                 | NSC            | In the morning, a mixture of honey and paste made from the leaves of the plant is given orally and heated leaves are applied externally over the affected area | [42]      |
| Euphorbiaceae   | S       | Senna alexandrina  | Mekhera                       | NA                                        | Bark                                   | NSC            | The powdered bark of the plant is creamed on the swelling                                   | [11]      |
| Euphorbiaceae   | S       | Euphorbia schimperiana | Gendal-elata                 | Doyo Gena in SNNPR                       | Root                                   | NSC            | The plant’s fresh roots are crushed, and the sap is added to the affected area                | [13]      |
| Euphorbiaceae   | S       | Euphorbia polyacantha | Carrico                      | NA                                        | Latex                                  | Skin cancer    | The latex of the plant is squeezed and creamed on the affected part                          | [42]      |
| Euphorbiaceae   | S       | Calpurnia aurea     | Digita                        | Debre Libanos monastery in Oromia region  | Leaves                                 | Neck cancer    | The leaves of the plant are powdered and soaked in cold water and taken orally               | [22, 42] |
| Euphorbiaceae   | S       | Senna singueana     | Busha                         | Across the region                        | Leaves and bark                        | NSC            | The powdered leaves of the plant are applied topically                                       | [30]      |
| Euphorbiaceae   | S       | Dichrostachys cinerea | Ader                         | Yalo district in Afar region             | Root                                   | Skin cancer    | The root of the plant is pounded and given orally                                            | [51]      |
| Fabaceae        | T       | Acacia seyal        | Wacho                         | Bensa in SNMP                            | Leaves                                 | NSC            | The leaves of the plant are chewed and swallowed                                             | [39]      |
| Fabaceae        | T       | Albizia lebeck      | NA                            | Adekfurdu in Tigray region Gubalafo district in northern Ethiopia | Root                                   | NSC            | Wheat dough paste of root powder is applied on the affected part                              | [61]      |
| Fabaceae        | S       | Melilotus suaveolens | Egg                          | Gondar in Amhara region                   | Leaves                                 | Lung cancer    | Crush, smash in water, filter, and then drink                                                | [45]      |
| Fabaceae        | S       | Calpurnia aurea     | Vegeta                        | Debre Libanos in Oromia region            | Leaves                                 | Neck cancer    | Powder is mixed with water and taken orally                                                   | [59]      |
| Fabaceae        | S       | Calpurnia aurea     | Digita                        | Debre Libanos in Oromia region            | Leaves                                 | Neck cancer    | The leaves of the plant are made a paste and put on the affected area                         | [22]      |
| Fabaceae        | S       | Calpurnia aurea     | Digita                        | Bahir Dar Zuria in Amhara region          | Leaves and seed                        | NSC            | Powdered leaves or seeds are immersed in cold water and then drank                           | [42]      |
| Fabaceae        | S       | Crotalaria incana   | Chelke                        | Doyo Gena in SNNPR                       | Leaves                                 | NSC            | Fresh leaves are pounded and the sap was put on the affected area                              | [30]      |
| Fabaceae        | S       | Senna singueana     | Gefa                          | Bahir Dar Zuria in Amhara region          | Leaves                                 | NSC            | Fresh leaves are pounded, soaked in water, and drank                                         | [30]      |
| Family          | Habitat | Plant name               | Local name       | The region in which the plant can be found | Part of the plant used to treat cancer | Type of cancer | Ethnobotanical preparation                                                                 | Reference |
|-----------------|---------|--------------------------|------------------|---------------------------------------------|---------------------------------------|----------------|------------------------------------------------------------------------------------------|-----------|
| Fabaceae        | S       | *Crotalaria agatiflora*  | Unknown          | Bale Goba in Oromia region                  | Seed                                  | NSC            | Dry seeds are powdered, mixed with honey, and put on the affected area                    | [30]      |
| Fabaceae        | T       | *Millettia ferruginea*   | Henge-ddicho     | Sidama regional state                       | Bark                                  | NSC            | The juice of bark is drank for cancer treatment                                          | [46]      |
| Flacourtiaeeae  | S       | *Doryalis abyssinica*    | Kashim           | Fiche district in Oromia region             | Fruit                                 | NSC            | Eating 6–10 fruits per day                                                                | [58]      |
| Flacourtiaeeae  | S       | *Doryalis abyssinica*    | Kashim           | Dale district in SNMP                       | Bark                                  | NSC            | The raw bark of the plant was chewed and then consumed                                   | [58]      |
| Hydnoraceae     | T       | *Hydra abyssinica*       | Shifa’a weyn     | Harari region                               | Bark and roots                        | NSC            | Bark or root of the plant is powdered with *Echinopskebericho* tuber and added in the daily food and eating | [21]      |
| Iridaceae       | H       | *Gladiolus candidus*     | Milas-golgul     | Dega Damon in Amhara region                 | Roots                                 | NSC            | The root is dried and powdered and put on the affected area or drank                     | [57]      |
| Iridaceae       | H       | *Gladiolus candidus*     | Milas-golgul     | Dega Damot in Amhara region                 | Roots                                 | NSC            | The plant’s root is dried, crushed, and put on the wound part, or root powder is taken orally with water | [57]      |
| Juncaceae       | H       | *Juncus effusus*         | Etse-felatsut    | Across the region of Ethiopia               | Roots                                 | NSC            | The root of the plant is used by mixing with other herbal plants and applied topically on the affected area | [11]      |
| Juncaceae       | H       | *Cleroden-drum myricoides* | Misrichi         | Dale district in SNMP                       | Leaves                                | Blood cancer   | The honey is mixed with the grounded leaf part of the plant and drank, or the root of the plant is boiled and mixed with *Zanthoxylum chalybeum* shoot | [49]      |
| Lamiaceae       | H       | *Leonotis ocymifolia*    | Arma-USA         | Bale Goba in Oromia region                  | Leaves                                | NSC            | Fresh leaves are crushed, macerated overnight, and drank                                | [30]      |
| Lamiaceae       | H       | *Ajuga leucantha*        | Tiksasht         | North Bench in SNMP                         | Leaves                                | NSC            | The fresh leaves of the plant are grounded, and the sap is put on the affected area      | [30]      |
| Lamiaceae       | H       | *Ocimum gratissimum*     | Make-desisa      | Wendo Genet in SNMP                         | Roots                                 | NSC            | Fresh roots are crushed, boiled, and drank                                               | [30]      |
| Lamiaceae       | H       | *Salvia nilotica*        | Keskeo           | North Bench in SNNP and Gonde in Amhara region | Leaves                                | NSC            | The fresh leaves of the plant are powdered with water and made a paste                   | [60]      |
| Lamiaceae       | H       | *Thymus schimperi*       | Design           | Bale Goba in Oromia region                  | Leaves                                | NSC            | Dry leaves are decocted and drank                                                        | [30]      |
| Lamiaceae       | S       | *Premna schimperi*       | Xullangee         | Bule Horra in Oromia region                 | Leaves                                | NSC            | Pounding and making solution                                                             | [5]        |
| Lamiaceae       | T       | *Pycnostachys abyssinica* | Montana           | Doyo Gena in SNNPR                          | Leaves                                | NSC            | The sap is added to the affected area by crushing the pounded fresh leaves of the plant   | [30]      |
| Family          | Habitat | Plant name               | Local name          | The region in which the plant can be found               | Part of the plant used to treat cancer | Type of cancer | Ethnobotanical preparation                                                                 | Reference |
|-----------------|---------|--------------------------|---------------------|----------------------------------------------------------|----------------------------------------|----------------|-------------------------------------------------------------------------------------------|-----------|
| Lamiaceae       | S       | Leonotis ocymifolia     | Ye fereszeng       | Fiche district in Oromia region                          | Leaves                                 | Neck cancer    | For one day, the chopped leaves of the plant are applied to the affected area               | [62]      |
| Lamiaceae       | S       | Leonotis ocymifolia     | Raskimir            | Across the region of Ethiopia                            | Root                                   | NSC            | Sometimes, it is used with the combination of Leonotis africana                           | [11]      |
| Lamiaceae       | S       | Satureja abyssinica     | Este meaza          | Across the region of Ethiopia                            | Leaves                                 | NSC            | The leaves of the plant are combined with other herbs and applied topically                | [11]      |
| Lamiaceae       | S       | Roca myricoides         | Mardhisiis a        | Bule Hora, Oromia region, Bensa in SNMP                 | Leaves and root                        | NSC            | Crush the root, mix it with butter, and apply; chop the leaf and eat or apply              | [30, 49] |
| Liliaceae       | H       | Gloriosa superba        | Etse-lebona         | In most of Ethiopia and the Harari region                | Roots, seeds, and leaves               | Breast cancer  | Seeds and roots of the plant dried and crushed and mixed with water are taken orally. The root of the plant is chewed and put externally on the affected breast. The leaves of the plant are made paste and tied on the tumour | [21, 42] |
| Lobeliaceae     | T       | Lobelia rhynchopetalum  | Ets-kemun           | Across the region of the country                        | Root                                   | NSC            | The root of the plant is combined with other herbs and put topically                       | [45]      |
| Loganiaceae     | S       | Buddleja polystichum    | Anfar               | Dale district in SNP Ada’s district, east Shewa zone in Oromia region | Leaf                                   | NSC            | Crushed, cold macerated, and taken orally                                                 | [49]      |
| Loganiaceae     | W/C     | Malva verticillata      | Lut                 | Adi district, east Shewa zone in Oromia region          | Leaves                                 | NSC            | The leaf is crushed and attached to the swelling after being warmed over an open flame    | [13]      |
| Malvaceae       | S       | Sida schimperiana       | Kotejebessa         | Wendo Genet in SNP Nekemte town, east Wellega in Oromia region | Root and leaves                        | Wound cancer   | Fresh leaves and roots of the plant are pounded, macerated, and drank                     | [30]      |
| Malvaceae       | S       | Sida schimperiana       | Chef Greg           | Debark district in Amhara region                         | Leaves and root                        | Neck cancer    | The juice made from fresh root is mixed with honey and taken orally                          | [30]      |
| Malvaceae       | S       | Sida schimperiana       | Chef Greg           | Debark district in Amhara region                         | Leaves and root                        | Neck cancer    | The root and leaves of the plant are crushed, powdered, and then put on the affected part | [11]      |
| Malvaceae       | H       | Malva verticillata      | Lut                 | East Shewa zone in Oromia region                         | Leaves                                 | Neck cancer    | The leaf of the plant is crushed, warmed, and then tied on the swelling                    | [13]      |
| Meliaceae       | T       | Lepidotrichilia volkensii | Tabecho             | Bensa in SNNP                                           | Leaves and fruit                       | NSC            | The leaves and fruit of the plant are chopped and mixed with water and taken orally        | [63]      |
| Family               | Plant name                   | Local name | Part of the plant used | Region used | The region in which the plant can be found                      | Type of cancer | Ethnobotanical preparation | Reference |
|---------------------|------------------------------|------------|------------------------|-------------|-----------------------------------------------------------------|----------------|---------------------------|-----------|
| Melianthaceae       | Bersama abyssinica           | Azamir     | Bark                   | Bahir Dar Zuria | in Amhara region, Oromia region, and Harari region               | Skin cancer   | The plant’s bark or stem is used to make an injection used to treat some types of tumours | [22]      |
| Melianthaceae       | Bersama abyssinica           | Azamir     | Bark                   | Bahir Dar Zuria | Woreda genet in Oromia region                                    | Skin cancer   | The roots of the plant are dried and grounded, mixed with honey and water and drank | [30]      |
| Menispermaceae      | Stephania abyssinica         | Kalala     | Roots                  | Across the region of Ethiopia | Dried and crushed and pasted and bandaged on the affected area | Skin cancer   | The root of the plant is dried and crushed and pasted and bandaged on the affected area | [21, 64] |
| Menispermaceae      | Stephania abyssinica         | Yeayehareg | Roots                  | Across the region of Ethiopia | Dried and crushed and pasted and bandaged on the affected area | Skin cancer   | The root of the plant is dried and crushed and pasted and bandaged on the affected area | [21, 64] |
| Moraceae            | Dorstenia barnimiana         | Work-bemeda | Roots, tuber, and aerial parts | Around Bahir Dar Zuria in Amhara region, and Harari region | Dried and crushed and pasted and bandaged on the affected area | Skin cancer   | The root of the plant is dried and crushed and pasted and bandaged on the affected area | [21, 64] |
| Moraceae            | Dorstenia barnimiana         | Worq-bemeda | Roots                  | Around Bahir Dar Zuria in Amhara region, and Harari region | Dried and crushed and pasted and bandaged on the affected area | Skin cancer   | The root of the plant is dried and crushed and pasted and bandaged on the affected area | [21, 64] |
| Moraceae            | Dorstenia barnimiana         | Quechee    | Fruit                  | Fiche district in Oromia region and Harari region, and Hareri region | Dried and crushed and pasted and bandaged on the affected area | Skin cancer   | The root of the plant is dried and crushed and pasted and bandaged on the affected area | [21, 64] |
| Myrsinaceae         | Myrsine africana             | Bensa      | Leaves and root        | Bahir Dar Zuria in Amhara region, and Harari region, and Hareri region | Dried and crushed and pasted and bandaged on the affected area | Skin cancer   | The root of the plant is dried and crushed and pasted and bandaged on the affected area | [21, 64] |
| Pittosporaceae      | Pittospermum abyssinicum     | Lela       | Leaves and root        | Bahir Dar Zuria in Amhara region, and Harari region, and Hareri region | Dried and crushed and pasted and bandaged on the affected area | Skin cancer   | The root of the plant is dried and crushed and pasted and bandaged on the affected area | [21, 64] |
| Plumbaginaceae      | Plumbago zeylanica           | Amera      | Roots, leaves, and bark | Bahir Dar Zuria in Amhara region, and Harari region, and Hareri region | Dried and crushed and pasted and bandaged on the affected area | Skin cancer   | The root of the plant is dried and crushed and pasted and bandaged on the affected area | [21, 64] |
| Plantaginaceae      | Plantago lanceolata          | Yebeqlat   | Seed                   | Hawassa city in SNNPR | Dried and crushed, powdered, and applied to the affected area | Skin cancer   | The root of the plant is dried and crushed, powdered, and applied to the affected area | [21, 64] |
| Family       | Habitat | Plant name            | Local name    | The region in which the plant can be found | Part of the plant used to treat cancer | Type of cancer | Ethnobotanical preparation                                                                 | Reference |
|-------------|---------|-----------------------|---------------|--------------------------------------------|--------------------------------------|----------------|---------------------------------------------------------------------------------------------|-----------|
| Plantaginaceae | H       | *Plantago lanceolata*  | Gorteb        | Sidama regional state                      | Seed                                 | NSC            | The dried seeds are powdered, crushed, and put into the cancer wound                         | [39]      |
| Plumbaginaceae | S       | *Plumbago zeylanica*   | Amera         | Harari region                             | Roots                                | Bone cancer    | The root is powdered and pasted on the affected area and bandaged                           | [21]      |
| Plumbaginaceae | S       | *Plumbago zeylanica*   | Amira         | Tigray, Amhara, Oromia region              | Roots                                | NSC            | The root of the plant is powder and combined with sulphur and placed on top position or powdered and drank with boiled tea or coffee | [65, 51] |
| Plumbaginaceae | S       | *Plumbago zeylanica*   | Americana     | Bahir Dar Zuria in Amhara region           | Leaves                              | NSC            | The juice is made from fresh leaves and taken orally                                          | [42]      |
| Podocarpaceae | T       | *Podocarpus falcatus*  | Bribie        | Not specified                             | Root                                 | NSC            | The plant’s dry root powder is mixed with water and is taken orally and applied topically to the affected area | [66]      |
| Podocarpaceae | T       | *Afrocarpus falcatus*  | Zigba         | Dale district in Sidamo region            | Leaves                              | NSC            | The juice of the leaf is taken for treating cancer                                            | [46]      |
| Podocarpaceae | T       | *Afrocarpus falcatus*  | Zigba         | Dek Island in Amhara region               | Root                                 | NSC            | Powdered dry root combined with water                                                        | [46]      |
| Polygonaceae  | H       | *Rumex abyssinicus*    | Mekumoko      | Harari region                             | Rhizome                              | Breast cancer  | Decocotdhot infusion is taken orally                                                         | [21]      |
| Polygonaceae  | H       | *Rumex abyssinicus*    | Moke-moko     | Seharti Samre in Tigray region            | Roots                                | NSC            | The root of the plant is powdered and mixed in a spicy stew and then used                    | [67]      |
| Polygonaceae  | H       | *Rumex abyssinicus*    | Mem-eqo       | Across the region of Ethiopia              | Roots                                | Breast cancer  | The root of the plant is powdered and creamed on the affected area of swelling. Decocotdho infusion is taken orally | [21, 11] |
| Polygonaceae  | H       | *Rumex nepalensis*     | Groucho       | Doyo Gena in SNMP                         | Roots and bark                       | NSC            | The dried roots of the plant are crushed and given with food, or the sap from the fresh bark is crushed and squeezed and then put on the affected area | [43]      |
| Polygonaceae  | H       | *Rumex nervosus*       | Huot/Embuacho | Seharti Samre district in Tigray region    | Leaf                                 | Breast cancer  | The leaves of the plant are pounded, and its paste is put on the affected area               | [67]      |
| Polygonaceae  | H       | *Rumex nervosus*       | Huot          | Seharti Samre in Tigray region            | Leaves                              | NSC            | Leaves are crushed and the paste is applied on the affected area                             | [67]      |
| Punicaceae    | T       | *Punica granatum*      | Roman         | Libo Kemke in Amhara region               | Fruit                               | NSC            | Crushed the fruit of the plant and eaten                                                   | [21]      |
| Ranunculaceae | H       | *Ranunculus multifidus*| Etesiol       | Debre Libanos monastery in Oromia region   | Roots                               | NSC            | On the affected area, the paste of the root is applied externally                            | [42]      |
| Ranunculaceae | H       | *Delphinium dayacaulon*| Sam-onya      | Harari region                             | Root                                 | NSC            | Concoction is taken orally                                                                  | [21]      |
| Family           | Habitat | Plant name                | Local name | The region in which the plant can be found | Part of the plant used to treat cancer | Type of cancer | Ethnobotanical preparation                                                                 | Reference |
|------------------|---------|---------------------------|------------|--------------------------------------------|----------------------------------------|----------------|-------------------------------------------------------------------------------------------|-----------|
| Ranunculaceae H  |         | *Thalictrum rhynchocarpum*| Sire Bizu  | Across the region of Ethiopia               | Roots                                  | NSC            | The root of the plant is mixed with other herbs and put topically                        | [11]      |
| Ranunculaceae H  |         | *Ranunculus multifidus*   | Etsesiol   | Debre Libanos monastery in Oromia region   | Leaves                                 | NSC            | Externally, the affected area is covered by the powdered leaves of the plant             | [59]      |
| Ranunculaceae H  |         | *Ranunculus multifidus*   | Etsesiol   | Debre Libanos monastery in Oromia region   | Roots                                  | NSC            | Powder dressing on the affected area                                                     | [59]      |
| Ranunculaceae S/C|         | *Clematis hirsuta*        | Amazon-hareg | All over Ethiopia                           | Leaves, stems, and bark                | Neck cancer    | The plant's bark, leaves, and stems are grounded into a powder that is applied directly on tumour sites | [42]      |
| Ranunculaceae W/C|         | *Clematis simensis*       | Yeazo-hareg| Libo Kemke/Amhara region                   | Leaves                                 | NSC            | Crushed and applied                                                                      | [45]      |
| Ranunculaceae C  |         | *Clematis virginiana*     | Fidy       | Bale/Oromia region                         | Leaves                                 | NSC            | Pounding the leaves, making solution, or mixing with butter                              | [30]      |
| Ranunculaceae C  |         | *Clematis simensis*       | Fireside   | Libo Kemkem district/Amhara region         | Leaves                                 | Skin cancer    | Crush the leaf and add it to the infected area                                          | [42]      |
| Ranunculaceae C/S|         | *Clematis hirsuta*        | Amazon-hareg| Bale/Oromia region                         | Leaves, stem, and bark                | Neck cancer    | The leaves are crushed and used as a bandage on the swelling                             | [57]      |
| Ranunculaceae C/S|         | *Clematis hirsuta*        | Amazon-hareg| All over Ethiopia                           | Leaves, stems, and bark                | Neck cancer    | The plant's bark, leaves, and stems are grounded into powder that is applied directly on tumour sites | [42]      |
| Ranunculaceae C  |         | *Clematis simensis*       | Yeazo-hareg| Libo Kemke/Amhara region                   | Leaves                                 | NSC            | Crushed and applied                                                                      | [45]      |
| Ranunculaceae C/S|         | *Clematis hirsuta*        | Amazon-hareg| Bale/Oromia region                         | Leaves, stem, and bark                | Neck cancer    | The leaves are crushed and used as a bandage on the swelling                             | [57]      |
| Rhamnaceae T     |         | *Ziziphus spina-christi*  | Geba       | All over Ethiopia                           | The whole parts                        | NSC            | It is used for the treatment of tumour                                                   | [42]      |
| Rosaceae T       |         | *Prunus africana*         | Tikurenchet| Bensa in SNNP                              | Bark and leaves                        | NSC            | Powdered bark of the plant is applied on the skin of the patient to get relief          | [68]      |
| Rosaceae T       |         | *Hagenia abyssinica*      | Kosso      | Across the regions of Ethiopia              | Root                                   | NSC            | Honey is mixed to the pounded root of the plant and then creamed on the affected part  | [11]      |
| Family         | Habitat | Plant name             | Local name            | The region in which the plant can be found | Part of the plant used to treat cancer | Type of cancer | Ethnobotanical preparation                                                                 | Reference |
|----------------|---------|------------------------|-----------------------|-------------------------------------------|---------------------------------------|----------------|-------------------------------------------------------------------------------------------|-----------|
| Rosaceae       | T       | Prunus africana        | Tikurenchet          | Bensa, SNNP Gubalafo district in Amhara region | Powdered bark                          | NSC            | Swelling the powdered bark of the plant                                                  | [68]      |
| Rubiaceae      | C       | Rubia cordifolia       | Enchibir             | Gubalafio district in Amhara region       | Roots                                 | Lung cancer    | The root part of the plant is powdered in water for three days and given orally            | [38]      |
| Rubiaceae      | C       | Rubia cordifolia       | Enchibir             | Across the regions of Ethiopia           | Roots                                 | NSC            | The root of the plant mixed with other herbs and put topically on the affected area         | [11]      |
| Rubiaceae      | T       | Pavetta gardenifolia   | Qadiidaa             | Bule Horra in Oromia region              | Root                                  | NSC            | Pounded and applied                                                                         | [69]      |
| Rutaceae       | T       | Zanthoxylum chalybeum  | Gada                 | Hawass in SNNR                            | Leaves                                | NSC            | The leaves of the plant are powdered and drank                                           | [69]      |
| Rutaceae       | T       | Fagaropsis angolensis  | Dergi                | NA                                       | Fruit                                 | NSC            | The juice made from the fruit of the plant is taken orally and applied externally to the affected area | [42]      |
| Rutaceae       | S       | Clausena anisata       | Limit                | Abay Gorge/Amhara region Around Fiche district in Oromia region | Leaves                                | NSC            | Dry leaves of the plant are powdered and mixed with honey and eaten                       | [30]      |
| Santalaceae    | T/S     | Oyris quadripartita    | Quote                | Leaves                                   | Pendant leaf                          | NSC            | The dried leaf of the plant is mixed with dried and grounded fruit of Myrsine africana and combined with water and taken orally | [59]      |
| Sapindaceae    | T       | Dodonaea viscosa       | Kitkita              | Root                                     | NSC                                   |                | Honey is mixed with the dried and powdered roots of the plant and drank                   | [46]      |
| Sapindaceae    | T       | Dodonaea angustifolia  | Ketketa              | Wide range part in Ethiopia              | All parts                             | Neck cancer    | The paste, which is made from whole parts of the plant is put on the affected area         | [18]      |
| Sapindaceae    | T       | Mimusops kummel        | Safa                 | Berber district in Oromia region          | Root                                  | Lung cancer    | The root and fruit of the plant are grounded and dissolved with a small amount of water and taken orally to treat lung cancer | [6]       |
| Sapindaceae    | T       | Mimusops kummel        | Galati               | Berbere district in Oromia region         | Root                                  | Lung cancer    | The roots are powdered, and a small amount is ingested with water                         | [6]       |
| Sapindaceae    | T       | Mimusops kummel        | Ishe                 | Benishangul, Amhara, and Gambela region   | Fruit root                            | Lung cancer    | The root and fruits of the plant are grounded and dissolved with a small amount of water and taken orally | [6]       |
| Sapindaceae    | S       | Sideroxylon oxyacanthum| Bunguude             | Dalle district in Sidama region           | Leaves                                | Cancer         | The leaf is macerated and given an overall flavour, sometimes with Zanthoxylum chalybeum leaf and honey | [49]      |
| Scrophulariaceae| S       | Verbascum inapticum    | Yefereszeng          | Dek Island in Amhara region               | Roots                                 | Breast cancer  | Powder mixed with hyena feces and latex                                                   | [22, 42] |
| Family         | Habitat | Plant name          | Local name | The region in which the plant can be found | Part of the plant used to treat cancer | Type of cancer | Ethnobotanical preparation                                                                 | Reference |
|---------------|---------|---------------------|------------|-------------------------------------------|---------------------------------------|----------------|-------------------------------------------------------------------------------------------|-----------|
| Simaroubaceae | T       | *Brucia antidysenterica* | Abalo      | Jimma in Oromia region                     | Leaves                                | NSC            | The leaves of the plant are powdered and mixed with young twigs to make pastes and placed on the affected area | [11]      |
| Simaroubaceae | T       | *Brucia antidysenterica* | Abalo      | Jimma in Oromia region                     | Steam, bark, and leaves               | NSC            | Paste is made from leaves and young twigs with water and drunk before meals                | [42]; [30]|
| Simaroubaceae | T       | *Brucia antidysenterica* | Waginos/Apollo | Jimma zone and Bale zone in Oromia region | Steam, bark, and leaves               | NSC            | The decoction is drank, and pastes are made from young twigs and powered leaves with water | [13]      |
| Solanaceae    | S       | *Discopodium penninervium* | Chechanga  | Doyo Gena in SNNPR                         | Leaves                                | NSC            | Fresh leaves of the plant are crushed and applied on the affected area                    | [30]      |
| Solanaceae    | S       | *Solanum nigrum*      | Embuayzerech | Across the region of Ethiopia               | Leaves, stems, and roots              | NSC            | The herb is boiled and put in our food daily for about three days                         | [22]      |
| Solanaceae    | S       | *Withania somnifera*  | Ozawa      | NA                                         | Root                                  | NSC            | The root is directly chewed orally                                                       | [11]      |
| Solanaceae    | S       | *Lycopersicon esculentum* | Tematim    | All over Ethiopia                          | Fruit                                 | NSC            | Without cooking, fresh fruit is washed and ate                                            | [42]      |
| Solanaceae    | H       | *Solanum americanum*  | Tikurawut  | NA                                         | Leaves, root, and steam              | NSC            | Leaves are boiled thoroughly and eaten                                                    | [67]      |
| Thymelaeaceae | H       | *India involucrata*   | Yezinge-rotelba | NA                                        | Roots                                | NSC            | The root of the plant is powdered and made paste with honey                               | [30]      |
| Verbenaceae   | S       | *Lantana trifolia*    | Hanshi-Bello | Wondo Genet in SNPMP                       | Leaves                                | NSC            | Fresh leaves are powdered and drank after being immersed in cold spring water            | [30]      |
| Verbenaceae   | S       | *Lippia adoensis*     | Kessie     | Abay gorge in Amhara region                | Leaves                                | NSC            | The dried leaves are powdered, soaked in cold water, and drank                           | [30]      |
| Vitaceae      | C       | *Rhoicissus tridentate* | Burigura    | Harari region                             | Root                                  | NSC            | Concoction is taken orally                                                              | [21]      |
| Vitaceae      | C       | *Cyphostemma serpens* | Eirini      | Gewan/Afar region                         | Root                                  | NSC            | Dry roots are grounded, then eaten, and added after being pasted with honey              | [30]      |
| Zygophyllaceae| H       | *Tribulus terrestris* | Camera     | Across the regions of Ethiopia             | All parts                             | NSC            | The plant is recommended as an anticancer                                                | [70]      |

NSC: nonspecific cancer; H: herb; S: shrub; T: tree; W: weed; C: climbing plant.
used to make anticancer remedies were leaves (36.76%), roots (27.2%), bark (12.5%), stem (5.1%), and fruits (7.35%) (Figures 2 and 3).

3.2. Pharmacology Activities to Treat Cancer

3.2.1. Plants Used against Breast Cancer. The most frequent cancer in women worldwide is breast cancer [37]. It is Ethiopia’s most common cancer, with high morbidity and mortality rates. The number of new cases increases year to year in the country [71]. According to Memirie et al. [72], of all cancer cases in Ethiopia, 23% accounts for breast cancer. It accounts for 33.3% of the cancers in women. Breast cancer can be treated scientifically using different MPs. Aerva javanica, commonly known as “Tobia,” has been confirmed to be used for cancer care. The crude extract from the leaves of Aerva javanica has an antiproliferative effect on human breast cancer cell lines (MCF-7) [73]. Kanchhoe petition, commonly called “indahul,” used to cure breast cancer. The gallic acid isolated from the leaf of Kanchhoe petition is responsible for its anticancer activity [56]. Extracts of Side-roxyylon oxyacanthum are reported to be used frequently against breast cancer [49].

In another study, chloroform extract of aerial part of Clematis sinensis was tested for anticancer activity using MTT assay against three breast cancer cell lines (JIMT-1, MCF-7, and MCF-10A). The IC50 (μg/ml) values obtained after treating two breast cancer cell lines (JIMT-1 and MCF-7) and MCF-10A (one normal-like breast epithelial cell line) were as 80 ± 19, 190 ± 70, and 97 ± 9, respectively [74]. Asparagus africanus, named “Yeset-kest” in the local Ethiopian language, also treats cancer. The roots of the plant have been reported for treating breast tumors [22]. People of various religious and ethnic groups in Ethiopia use Aerva javanica as a traditional medicine to treat multiple diseases, including cancer. A scientifically validated study found that the leaf extracts of Aerva javanica showed an antiproliferative effect on human breast cancer cell lines (MCF-7) [42]. Alkaloids isolated from Catharanthus roseus showed potent cytotoxicity against the MDA-MB-231 breast cancer cell line, with IC50 values ranging from 0.97 ± 0.07 μM to 7.93 ± 0.42 μM [40]. In another work of Tesfaye and coworkers [75], they checked the cytotoxic activity of Euphorbia schimperi, Crambe abyssinica, Aloe debrana, Vachellia nilotica, Camellia sinensis, Termitomyces schimperi, Pentarrhinum insipidum, Acmella caulihriza, Leonotis ocymifolia, Dorstenia barnimiana, Rumex nervosus, Clausena anisata, Helichrysum mannii, Salvia leucantha, Vernonnia auriculifera, Corymbia brachycarpa, and Croton macrostachyus extracts. Out of these, Euphorbia schimperi, Acokanthera schimperi, Kniphofia foliosa, and Kbalanchoe petition showed anti-proliferative activity against human breast (MCF-7) cancer cell lines.

3.2.2. Plants Used against Lung Cancer. Lung cancer is the leading cause of cancer-related deaths in men and the second leading cause of cancer-related deaths in women after breast cancer in the world [76]. GLOBOCAN 2020 is an online database providing global cancer statistics and estimates of incidence and mortality in 185 countries for 36 types and all cancer sites combined. According to GLOBOCAN data, there were approximately 18.1 million new cancer cases and 9.6 million deaths worldwide in 2018. Of these, 1.76 million died of lung cancer [77]. In the specified year, the number of new lung cancer cases in Ethiopia is 3.1% and it accounts for 4.3% of deaths from the total number of new cancer diseases [20]. Different MPs are used for the prevention and treatment of lung cancer. The seed extracts of Glinus lotoides (n-hexane, chloroform, methanol, and water) were tested for anticancer activity on the lung cancer cell line (Calu-3) using MTT assay. The result showed that methanol extract exhibits the highest anticancer activity with an IC50 value of 29.7 ± 1.3 μg/mL, while water extracts (IC50 = 262.2 ± 1.2 μg/mL) exhibit the least anticancer activity [78].

In another study, the anticancer activity of the root of Aloe pirottae was tested against stomach cancer (SNU-638), ovarian cancer (A2780), pancreatic cancer (MIA-PaCa-2), and lung cancer (A549) cell lines. The results demonstrated that all extracts exhibited anticancer activity with an IC50 value ranging from 6.37 to 29.69 μg/mL [79].

The in vitro cytotoxic activity of essential oils and extracts of Ocimum basilicum was tested on a cancerous cell line (MCF-7). The result showed that the cytotoxic activity of essential oil was found to be more effective than that of the extracts [80].

Steroids extracted from Withania somnifera leaves were tested for the lung cancer cell line (NCI-H460). The result showed that steroids exhibited suitable anticancer activities with an IC50 value of 0.45 μg/mL [81]. The cytotoxic activity T/Corr (%) of the extract (50 μg/mL) on the lung cancer cell line A427 after 96 hours was tested by Tesfaye et al. [75], with a crystal violet cell proliferation test. According to their research result, Crambe abyssinica, Aloe debrana, and Vachellia nilotica showed values of 29.29, 49.65, 26.76, 24%, and 20% respectively [62%].

3.2.3. Plants against Blood Cancer (Leukemia). Blood-forming stem cells are the source of all blood cells. Blood cancer is caused by defects in the differentiation of these stem cells, which mainly affect white blood cells. Bone marrow transplantation, chemotherapy, antibodies, cytokines, and tumor vaccinations are choices for improving leukemia patients’
survival rates [37]. Some Ethiopian plants such as Clerodendrum myricoides, Myrsine melanoploeeos, and Solanecio angulatus have demonstrated anticancer activity in the case of leukemia [11]. The flower and leaf extracts of Solanecio angulatus were tested for anticancer activities against HL-60 human leukemia cell. The flower extract of the plant showed higher anticancer activities against the cell line with an IC50 value of 27.39 μg/mL [82]. Essential oils of Myrtus communis were reported for the presence of 1,8-cineole, linalool, myrtenyl acetate, and myrtenol which is responsible for its anticancer activity against blood cancer (leukemia) [83]. Methanol and chloroform leaf extracts of Cynoglossum coeruleum were tested for anticancer activities against the HL-60 human leukemia cell line. The result indicated that the methanol extracts showed higher anticancer activity (IC50 = 183.95 μg/mL) than chloroform extract (312.62 μg/mL). The lowest IC50 value was recorded in methanol extract from Cynoglossum coeruleum flower with a value of 360.2 μg/mL [82]. In another study, Jatropha curcas seed extracts displayed potent inhibition against P388 lymphocytic leukemia (both in vitro and in vivo) [42]. One research report showed that Alkaloids isolated from Catharanthus roseus such as vincristine, vinblastine, vindesine, vinorelbine, and vinflunine exhibited cytotoxic activity against human leukemia cells [84]. According to another study, the anticancer activity of crude extracts of Rumex abyssinicus roots was observed in prostate, brain, and breast tumor cell lines and leukemia cell culture [22]. Flavonoids, namely, alpinumisoflavone and 4′-methoxycoumfavanone extracted from Erythrina asuberosa stem bark, were tested for anticancer activity against HL-60 cells (human leukemia) and the result confirmed their anticancer activity [85].

3.2.4. Plants Used against Skin Cancer. The most common cancer in the world is skin cancer. Melanoma is a type of skin cancer that involves basal and squamous cell carcinomas [37]. According to the WHO data from 2017, skin cancer deaths in Ethiopia accounted for 0.03 percent of all deaths. The age-adjusted death rate is 0.37 per 100,000 people of Ethiopia. The most recent WHO data from 2020 also showed that skin cancer deaths in Ethiopia accounted for 0.21 percent of all deaths, with new cases of 0.31% [86]. Phytochemicals with anti-inflammatory, immune-modulatory, and antioxidant properties have the best chance of acting as a chemopreventive in skin cancers [87]. Scopoletin (7-hydroxy-6-methoxy coumarin) from Gelsemium sempervirens has been reported to show anticancer activity against a skin cancer cell line (melanoma A-375) [88]. Plumbagin (a quinonoid constituent) (Figure 4) isolated from the root of Plumbago zeylanica was reported as having anticancer activity [89]. The methanol extract of the leaf of Plantago lanceolata was tested for anticancer activity. The result showed anticancer activities on the UACC-62 cell line with an IC50 value of 50.58 ± 11.15 μg/mL [90]. Triterpenes found from the root of Cucumis prophetarum and gallic acid isolated from leaves of Kalanchoe petiitana are also used to cure skin cancer [90]. Bussa and Belayneh [21] reported the ethnomedicinal use of Vernonia glaberrima leaves and their phytoconstituents against skin cancer. The crude extract obtained from leaves, stems, and barks of Clematis hirsute is used for treating tumor/cancer on the neck [13].

4. Bioactive Compounds Used for Cancer Treatment

MPs are the source of many secondary metabolites known for their anticancer activity [37]. Phenolic compounds, alkaloids, glycosides, and terpenoids are some examples of such secondary metabolites with anticancer activity [30].
4.1. Phenolic Compound. In plant species, phenolic compounds are formed biologically via flavonoid, phenylpropanoid, and shikimate and possess hydroxide groups in the aromatic ring. These phenolic molecules have been shown for their cytotoxic, antiproliferative, and antioxidant characteristics [91]. Ethiopia has many MPs used to treat cancer; for their cytotoxic, antiproliferative, and antioxidant characteristics, such as genistein, quercetin, myricetin, kaempferol flavonanes: naringenin, hesperidin, eriodictyol, flavanonols: taxifolin are used to take care of lung cancer, laryngeal cancer, and breast cancer [102].

In human leukemia cells, flavonoids extracted from Erythrina suberosa stem bark such as 4’-methoxylchalcone and alpinumisoflavone were found to have cytotoxic effects [85]. Flavonoids extracted from Cassia Angustifolia, such as scutellarein, quercimeritrin, and rutin demonstrated considerable anticancer activity against MCF-7, Hep2, and HeLa cell lines, with lower cytotoxicity towards the HCEC cell line [103]. The crude extracts/fractions of Clerodendrum myricoides, Vernonie leopoldii, Dovyalis abyssinica, Sideroxylon oxyacanthum, Clematis longicauda, Zanthoxylum chalybeum, and Clematis sinensis were tested for anticancer activities and found cytotoxic effects against various breast cancer-derived cell lines [74].

Bioactive compounds such as luteolin, sesquiterpene lactones, coumarins, and phenolic acids isolated from leaves and shoots of Vernonia amygdalina have shown cancer chemoprevention [44]. One study observed the anticancer activity in Cassia angustifolia extract seed powder against the tested HCEC, Hep2, HeLa, and MCF-7 cell lines. The IC50 value of methanol extract against HeLa cells was 5.45 g/L and 4 g/L against MCF-7 cells, lower than the drug taxol 6.07 g/L and tamoxifen 6.4 g/L. This anticancer activity of various cancer cells in a concentration-dependent manner with a maximum concentration of 80 μg/mL. This anticancer activity of the extract can be attributed to its flavonoid and polyphenol contents in the extracts [55]. Some of the advanced anticancer flavonoids used to treat cancers are myricetin-3-O-alpha-L-rhamnopyranoside, flavone-8-acetic acid, quercetin 3-O-D-galactopyranoside, chrysosierol, nobiletin, silybin, flavopiridol, quercetin-3-O-amyloid esters, xanthone, indirubin, 5,6 dimethylxanthene-4-acetic acid, diosmetin, and myricetin-3-O-alpha-L-rhamnopyranoside (Figure 5) [101].
4.3. Alkaloids. Alkaloids are essential chemical compounds that can be used to discover new drugs. In vitro and in vivo, some alkaloids derived from natural herbs have anti-metastasis and antiproliferative effects on various cancers. Alkaloids including vinblastine and camptothecin have also been used to develop anticancer drugs [104]. The vinca alkaloids, such as vinblastine, vinorelbine, and vincristine, were the first plant-derived anticancer agents to gain approval...
for clinical use [87]. Some of the alkaloids used having anticancer activities are taxol, vincristine, vinblastine, 9-methoxy camptothecin, berberine, schischkiniin, coronaridine, naucleorals, monoamine, camptothecin, an indole alkaloid, and protoberberine [105] (Figure 6). In Ethiopia, the alkaloids extracted from the root of *Gloriosa superba* are used to treat breast cancer. When the root is chewed and applied externally to the affected area, it relieves and recovers pain [22, 42]. Phytochemical studies conducted in the Harari region have shown that the alkaloids and glycosides in the roots of *Hydnora abyssinica* are vital for cancer treatment [38]. The chloroform extract of *Clematis simensis*, rich in alkaloid bioactive compounds, showed cytotoxicity against three breast cancer cell lines. Two breast cancer cell lines JIMT-1 and MCF-7 showed IC$_{50}$ values of 80 μg/mL and 190 μg/mL, respectively. One of the normal-like breast epithelial cell lines (MCF-10A) has 97 μg/mL [74]. The alkaloids, which are also present in the flower of *Solanecio angulatus*, showed in vitro cytotoxicity properties with an IC$_{50}$ value of 133.72 μg/mL in the tested cell line (HL-60) [30]. Solasonine and solamargine alkaloid (Figure 6) molecules, which were isolated from *Solanum nigrum*, exhibited anticancer activities on the human gastric cancer cell line (MGC-803) with IC$_{50}$ values of 5.2 μg/mL and 8.77 μg/mL, respectively [40].

4.4. Steroids. A group of natural or synthetic organic compounds with a molecular structure of 17 carbon atoms grouped in four rings is known as steroids. In genetics, chemistry, and medicine, steroid hormones play a significant role. Hundreds of steroids have been discovered in fungi, animals, and plants [106]. Medicinal plant steroids are well-known secondary metabolites to have anticancer activity [107]. Bioactive compounds of steroids which were isolated from *Withania somnifera* such as 5,6,14,15 diepoxy-4,27-dihydroxy-1-oxowitha-2,24-dienolide and withaferin-A (Figure 7) showed anticancer activity to the human lung cancer cell line (NCI-H460) with 0.45 μg/mL and 8.3 μg/mL IC$_{50}$ values, respectively, [81]. In addition, cytotoxic activities were shown in extracts of *Bersama abyssinica*.
Hellebrigenin 3,5 diacetate, hellebrigenin 3-acetate, bersenogenin, 3-epiberscillogenin, and berscillogenin demonstrated cytotoxic activities in the plant extract [108, 109]. Physalin B, D, F steroids which are found in *Physalis angulata* showed anticancer activities on different cancer cell lines such as KB, A549, HCT8, and PC3 with the lowest EC₅₀ (μg/mL) value of 0.9 (for KB), 1.3 (for A549), 1.0 (for HCT8), and 0.9 (for PC3), respectively, for physalin F, physalin D, and physalin B [110].

4.5. Essential Oil. Essential oils (EOs) are well-known anticancer bioactive compounds obtained from medicinal and aromatic plants. Essential oils are highly volatile, aromatic yields obtained from plants. Due to their volatility, they can easily be extracted by steam distillation from different natural sources [111]. They may be a generic word for the liquid and highly volatile plant constituents with a distinct odor [111]. EOs having anticancer properties are listed in Figure 8. They are present in plants as secondary metabolites in their flowers, leaves, fruits, buds, seeds, rhizomes, barks, and roots [112, 113]. The essential oil such as limonene and perillyl alcohol, which is extracted from *Citrus sinensis*, are used for anticancer activities [114], and terpinene-4-ol, a-thujone, β-citronellal, α-pinene, γ-eudesmol, δ-cadinene, and methyl cinnamate from the Lamiaceae family are used for anticancer activities [115] as illustrated in Figure 8. The presence of bioactive compounds such as citronellyl acetate, pulegol, and citronellol in essential oils from *Pulicaria inuloides* was used for anticancer activity against liver, breast, and colorectal/colon cancers [116]. The essential oils derived from the flower of *Achillea ligustica*, leaf and the seed of *Coriandrum sativum*, leaf of *Melaleuca alternifolia*, the seed of *Nigella sativa*, and aerial parts of *Pelargonium graveolens* are used to treat different cancer diseases [117]. Some bioactive compounds such as linalool, 1,8-cineole, myrtenyl acetate, and myrtenol in *Myrtus communis* essential oil have anticancer properties in the case of blood cancer (leukemia) [83].

4.6. Other Bioactive Compounds. Various studies have shown that bioactive compounds such as fucoxanthin can be used to prevent breast cancer and triterpenes, anthocyanins, and saponins can be used to treat lung cancer. Blood cancer can be prevented using epigallocatechin gallate and rosavin [118]. Various compounds have been isolated from *Bersama abyssinica* to determine the plant’s anticancer or antitumor function. Lignin and hallebergenin 3-acetate are two of these compounds that have been shown to inhibit tumor growth [22]. Garcinol, limonoids, crocin, and genistein are used to prevent pancreatic cancer [118]. The root of *India involucrat*, also known as “Yezngerotelba” in Amharic, can treat cancer, including diterpenes, and genin, mezerein, gnidilatidin, gnidiglucin, and gniditrin are used to prevent cancer isolation biologically active compounds [22]. Boswellia acids in boswellia species give a defense mechanism to have anticancer activities [119]. The presence of gallic acid isolated from the leaves of *Kalanchoe petition*, which is commonly called “indahula,” is also essential to cure breast cancer [56]. It has been documented that the roots of *Asparagus africanus* are used to treat tumors [22]. Three lignans isolated from *Carissa spinarum*, namely, nortrachelogenin, carin, and norcarisalogenin, were found to be cytotoxic to WI38, MCF7, and A549 cell lines. Compared with carisal and nortrachelogenin, carisal shows higher cytotoxic activity against these three cell lines, with an IC₅₀ value of 1 μg/mL [40].

5. Conclusion and Future Perspective

Several plant species are already being utilized to treat or prevent cancer. Multiple studies have identified plant species with
anticancer characteristics, emphasizing herbal medicine in developing nations. In Ethiopia, many MPs can treat various types of cancer, such as breast cancer, lung cancer, blood cancer, and skin cancer and tumors. The ethnomedical application of MPs for cancer treatment confirmed that plant leaves are the most valuable for preparing anticancer drugs (36.76%), followed by roots (27.2%), bark (12.5%), and flowers (1.5%). According to the analyzed data, the Euphorbiaceae family has the highest percentage (10.71%) of plant families utilized to treat cancer. The Asteraceae and Lamiaceae families have the second (7.1%) and third (6.1%) values, respectively. Regarding their habit, shrubs account for (39.5%) followed by herbs (33.8%), trees (17.9%), and climber or weed (8.8%).

Although numerous MPs have been utilized ethnomedically to treat cancer, only a few MPs have been formally examined for anticancer activity. A few secondary metabolites and pure isolated compounds have been tested against cancer cell lines in vitro. Therefore, it is imperative to conduct detailed phytochemical research to isolate new anticancer drugs. Since the traditional knowledge for anticancer medicines provides basic information for further scientific research on the synthesis of anticancer drugs, it is necessary to conduct comprehensive ethnomedical research. The anticancer mechanism of these medicinal plant extracts is still unclear. Therefore, more in-depth scientific research is needed, which is the homework for researchers to conduct further studies.

Abbreviations
AIF: Alpinumisoflavone
FAA: Flavone-8-acetic acid
MLF: 4′-Methoxylicoflavanone
MP: Medicinal plant
MTT: 3-(4,5-Dimethylthiazol-2-yl)-2,5-diphenyl-2H-tetrazolium
SRB assay: Sulforhodamine B
EOs: Essential oil
NSC: Nonspecified cancer
SNNP: Southern Nations, Nationalities, and peoples
TMs: Traditional medicines
WHO: World Health Organization

Conflicts of Interest
The authors declare that they have no competing interests.

Authors’ Contributions
LA and MG drafted the review. AB prepared the different tables and figures required for the manuscript. RKB provided guidance during the development of the idea and wrote and revised the manuscript. The authors read and approved the final manuscript.

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