ABSTRACT

INTRODUCTION: Kamchia Nature Complex is part of the wetlands of importance in Bulgaria and has a global significance for preserving Europe’s unique freshwater swamp forests also known as flooded (flood-plain) forests (Bulgarian, Turkish: longoz).

AIM: The study aims to bring up to date the list of medicinal plants in the area of Kamchia Nature Complex and to create a present-day database of their ecological and biological characteristics, floral elements, conservation significance and status. In addition, this study is designed to collect data available on the healing properties, usable parts, and the groups of diseases these medicinal plants are applicable for.

MATERIALS AND METHODS: Field surveys were conducted during the 2013–2015 vegetation seasons applying enroute survey methods.

Floristic analysis was performed by the Tolmachev’s method (1974).

Species were determined by “Flora of the Republic of Bulgaria” and “Identification. Guide to Higher Plants in Bulgaria”.

RESULTS AND DISCUSSION: We have identified 183 species of medicinal plants out of 435 species of higher plants. The established medicinal plants refer to 60 families and 150 genera. The prevailing biology type is the herbaceous perennial plants—102 species (56%). The mesophyte plants occupy dominant position in terms of moisture and humidity as a factor—91 species (50%).

Floristic analysis reveals Eurasian geo-elements as being predominant—34 (19%), with 60 (33%) species of different types of Mediterranean distribution.

Species of conservation significance represent 20% of medicinal plants.

The established medicinal plants have more than 30 species of healing activities, one third of which is used primarily for treatment of gastrointestinal and respiratory diseases. Species in which the above ground portion of the plant is collected for its plant substance constitute half of the established medicinal plants.

CONCLUSION: Survey results reveal a considerable variety of medicinal plants in Kamchia Natural Complex area. They feature a variety of healing properties and are applicable for a wide range of diseases.

Keywords: wetlands, medicinal plants, Kamchia Nature Complex
INTRODUCTION

Kamchia Nature Complex is part of the wetlands of importance in Bulgaria and has a global significance for preserving Europe’s unique freshwater swamp forests also known as flooded (floodplain) forests (Bulgarian, Turkish: longoz) (1). Kamchia river floodplain around the river’s estuary and its downstream are in the Red List critically endangered category wetlands in Bulgaria with Identification No. 0985; Kamchia River estuary and Maznia Azmak flooded area are in the vulnerable wetlands category with Identification No. 9010 and No. 0758 (2).

Intensive floristic studies of Kamchia Nature Complex area were carried out within the 1992–1994 period as part of the North Wetlands Coastal Area project of the Bulgarian-Swiss Biodiversity Conservation Programme (BSBCP) (3). However, there is limited evidence and few publications on the biological diversity of medicinal plants in the area (3,4,5).

AIM

The present study is part of a larger survey of the biological diversity of medicinal plants of the Northern Black Sea wetlands in Bulgaria and aims to supplement the available research data on medicinal plants in the Kamchia Nature Complex. We take aim to create an up-to-date database of their ecological and biological characteristics, floral elements, conservation significance and status. Along with it we collected data on the healing activities and usable parts of the established medicinal plants, together with data on the diseases they are applicable for.

MATERIALS AND METHODS

The surveyed territory is located approx. 20–25 km south of Varna and stretches east of the Varna–Burgess route to the village of Staro Oryahovo. It includes floodplain forests known as “Bulgarian Longoz, extensive areas of sandy dunes and a beach strip, shrub and grasslands, freshwater marshes and marine aquaria, as well as adjacent fishponds” (3).

Field surveys were conducted during the 2013–2015 vegetation seasons applying enroute survey methods.

Floristic analysis was performed by the Tolmachev’s method (1974) (6). Species were determined by “Flora of the Republic of Bulgaria” (7,8,9,10,11) and “Identification. Guide to Higher Plants in Bulgaria” (12).

Florigenic analysis of the species was done according to the classification of Asyov and Petrova (2006) (13).

Status of medicinal plants was determined by the Medicinal Plants Act (2000, 2014) (14) and the National Strategy for Biodiversity Conservation (15).

The conservation status of species was defined at national level according to the ”Red Data Book of Bulgaria” (16), the Biological Diversity Act (2002, 2007) (17), Order RD-83 of 03.02.2014 (18), and at an international level as defined in Lucas (1983) (19), the IUCN Red List (2014) (20), Appendix 1 to the Convention on the Conservation of European Wildlife and Natural Habitats (21) and the Appendices to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (22). Endemism was presented at the level of Balkan and Bulgarian endemics according to “Balkan Endemics in the Bulgarian Flora” (23) and “List of Bulgarian Endemic Plants” (24).

Phytotherapeutic properties of the plants were described as per Petkov (1982) (25), Asenov (1988) (26), and Nikolov (2006) (27); the applications in traditional medicine were according to Petkov (1982) (25).

RESULTS AND DISCUSSION

We identified 435 species of higher plants in the Kamchia Nature Complex area. We determined 183 species or 42% of the flora as medicinal plants. Of these, 173 (40%) were medicinal plants as per the Medicinal Plants Act (2000, 2014) and 84 species (19%) were classified as medicinal plants according to the National Strategy for Biodiversity (14, 15, Hardalova et al. 1994). They accounted for 42% of the area’s higher flora community and 24% of the wild plants in Bulgaria.

The medicinal plants established for the area belonged to 60 families and 150 genera. Families with the greatest number of species were: Asteraceae—21 (11%), Lamiaceae—13 (7%), Fabaceae—12 (7%), Rosaceae—11 (6%), Apiaceae—10 (5%), Ranunculaceae—7 (4%), Scrophulariaceae—7 (4%), and Polygonaceae—6 (3%), accounting for 47% of the established species. There were 9 less represented families
with 4 species each, 4 families with 3 species each, 10 families with 2 species, and 28 families were represented by 1 species each. Apart for Poaceae, Ranunculaceae, and Polygonaceae, the rest of the families were duly represented with regards to the number of species in the flora of surveyed area (3).

Herbaceous perennial type plants were the predominant plant biology type—102 species (56%), followed by the annual ones—28 species (15%), and the shrubs—19 species (10%). Biennial plants were represented by 13 species (7%), the typical tree species were 11 (6%), annuals to biennials accounted for 6 species (3%), while biennials to perennials and shrubs to trees had 2 species (1%) to account for.

Analysis displayed that distribution of the established for the area medicinal plants by biological type followed the described flora species distribution. Herbaceous perennial plants were prevalent (241 species or 54%), followed by the annuals (92 species—21%) and the shrubs (24 species or 6%) (3).

Considering moisture and humidity as a factor, Mesophyte plants were the dominant medicinal plants—91 species (50%), followed by Hydrophytes—46 species (25%), and Xerophytes—41 species (22%). Hydrophytes were represented by 5 species (3%) only. The flora of Kamchia Nature Complex had similar ecological structure with Mesophytes (225 species or 52%) being the predominant type, followed by Hydrophytes (109 species or 24%) and xerophytes (89 species or 21%). Hydrophytes were represented by 12 species or 3% (3) only.

Primary florigenic analysis revealed prevalence of Eurasian geo-elements—34 (19%). They were dominant in the flora of the surveyed area as well—119 species (26%) (3). Euro-Mediterranean came next—28 (15%), followed by Euro-Siberian—23 (13%), European—17 (9%), Cosmopolitans—16 (9%), sub-Mediterranean—16 (9%), boreal—13 (7%), sub-boreal—13 (7%), and others. Generally, there were 60 species with different types of Mediterranean distribution, thus accounting for 33% of the total number of medicinal species. Percentage representation of Mediterranean species—33%, was similar for Kamchia Natural Complex.

Analyses suggested that 20% of the 183 established medicinal plants belonged to different conservation categories.

The European Red List for endangered species lists 18 species under the category of near threatened: Alisma plantago-aquatica L., Leucojum aestivum L., Angelica sylvestris L., Bidens tripartita L., Carpinus betulus L., Pulmonaria officinalis L., Myriophyllum spicatum L., Iris pseudacorus L., Lycopus europaeus L., Mentha aquatica L., Lemna minor L., Colchicum autumnale L., Lythrum salicaria L., Nymphaea alba L., Rumex hydrolapathum Huds., Lysimachia nummularia L., Samolus valerandi L., Caltha palustris L.

The Bulgarian Red Data Book for endangered species includes three species as endangered: Eryngium maritimum L., Nuphar lutea (L.) S. et S., Nymphaea alba L. Protected plants are Eryngium maritimum L., Nuphar lutea (L.) S. et S., Nymphaea alba L., Anacampsis pyramidalis (L.) Rich. and Himantoglossum hircinum (L.) Spreng, according to Bulgarian Biological Diversity Act, Appendix 3, Article 37. Conservation measures and regulated use is required for Leucojum aestivum L. and Orchis purpurea Huds as per the Bulgarian Biological Diversity Act, Appendix 4, Art. 41 (1). There are seven species prohibited for collection from their natural habitats pursuant to Order No. RD-83 (03.02.14) of the Minister of Environment and Water issued on the grounds of the Medicinal Plants Act, Art. 10 (1, 2, 3): Althea officinalis L., Artemisia santonicum subsp. patens (Neibr.) K. Pers., Glaucium flavum Crantz, Inula helenium L., Orchis purpurea Huds., Ruscus aculeatus L. and Valeriana officinalis L.

There is one medicinal plant under special protection and use regulations—Betonica officinalis L., for which maximum quantities for collection from its natural habitat are annually set. The above restriction is set by Order No. RD-83 of 03.02.2014 of the Minister for the Environment and Water issued on the basis of the Medicinal Plants Act, Article 10 (1,2,3).

We grouped the established for Kamchia Nature Complex medicinal plants according to the diseases they are applicable for in Table 1.

Analysis suggests more than 30 different types of healing activities of the established medicinal plants. Most of them act as diuretics (18 species). This number does not exceed significantly the number of other groups with different healing activities. The predominant part of species (59), representing one
### Table 1. Groups of diseases, healing activities and plant substance

| Species                     | Healing Action                                      | Plant Substance                              |
|-----------------------------|-----------------------------------------------------|----------------------------------------------|
| **Plants Used for Treatment of Cardiovascular Diseases** |                                                     |                                              |
| Allium rotundum L.          | atherosclerosis, antimicrobial                       | Bulbus Allii                                 |
| Crataegus monogyna Jacq.    | cardiovascular, decreasing blood pressure, sedative | Folium et flos Crataegi cum foliis           |
| Geranium robertianum L.     | hypotensive, sedative                                | Rhizoma, folim et flos Geranii               |
| Lycopus europaeus L.        | cardiovascular                                       | Herba Lycopi                                 |
| Nymphaea alba L.            | cardioactive agent                                   | Rhizoma Nymphaeae albae                      |
| Pastinaca sativa L.         | cardiovascular, spasmyotic, hypotensive              | Radix et fructus Pastinacae                  |
| Periploca graeca L.         | cardioactiv agent                                    | Cortex seu stipites Periplocae graecae       |
| Thalictrum flavum L.        | hypotensive, antitumor action                        | Herba Thalictri                              |
| Viscum album L.             | hypotensive, cardiotonic agent, vasodilating         | Herba Visci                                  |
| **Plants Used for Treatment of Gastrointestinal Diseases** |                                                     |                                              |
| Alnus glutinosa (L.) Gaertn.| antidiarrheal agent, astringent                      | Fructus, folium et cortex Alni               |
| Artemisia vulgaris L.       | appetite exciting, sedative, haemostatic action      | Herba et radix Artemisiae                    |
| Arum maculatum L.           | anti-inflammatory                                    | Tubura Ari                                   |
| Ballota nigra L.            | spasmyotic, anti-inflammatory, pain reliever         | Herba Ballotae                               |
| Betonica officinalis L.     | spasmyotic, stimulates the appetite                  | Rizoma, radix et herba Betonicae             |
| Carpinus betulus L.         | antimicrobial, antidiarrheal agent                   | Folium, flos et cortex Carpini               |
| Centaurea cyanus L.         | appetite exciting, stimulates the release of bile, diuretic | Flores Centaureae                           |
| Chamomilla recutita (L.) Rausch | anti-inflammatory, antiseptic, spasmyotic         | Flores Chamomillae                           |
| Chelidonium majus L.        | spasmyotic, stimulates the release of bile           | Herba Chelidonii                             |
| Convolvulus arvensis L.     | laxative, diuretic, epithelium tonic                 | Herba Convolvuli                             |
| Cornus mas L.               | astringent                                          | Fructus Corni                                |
| Cuscuta europaea L.         | purgative, diuretic, pain reliever                  | Herba Cuscutae                               |
| Datura stramonium L.        | spasmyotic                                          | Folium Stramonii                             |
| Frangula alnus Wild.        | laxative, antidiarrheal agent                        | Cortex Frangulae                             |
| Fraxinus ornus L.           | astringent                                          | Cortex Fraxini                               |
| Fraxinus oxycarpa Wild.     | astringent                                          | Corthex Fraxini                              |

Biodiversity and Healing Activities of Medicinal Plants in the Area of Kamchia Nature Complex
| Plant Name                        | Activity                          | Part Used                          |
|----------------------------------|-----------------------------------|------------------------------------|
| **Fumaria officinalis L.**        | spasmolytic, stimulates the release of bile | Herba Fumariae                     |
| **Geum urbanum L.**               | anti-inflammatory, antidiarrheal agent, antimicrobial | Rhizoma et radix Gei urbani        |
| **Heracleum sibiricum L.**        | spasmolytic, hypotensive           | Radix et fructus Heraclei sibirici |
| **Lotus corniculatus L.**         | spasmolytic, analgesic             | Herba Loti corniculati             |
| **Malus sylvestris Mill.**        | astringent, hypotensive,           | Fructus Mali sylvestris            |
| **Malva sylvestris L.**           | spasmolytic, expectorant,          | Flos et folium Malvae sylvestris   |
| **Nuphar lutea (L.) S. et S.**    | anti-inflammatory                  | Rhizoma Nupharis lutei             |
| **Prunus spinosa L.**             | astringent, anti-inflammatory      | Flos et fructus Pruni spinosae     |
| **Pulicaria dysenterherica (L.) Bernh.** | laxative, against insects       | Herba et radux Pulicariae          |
| **Rubus caesius L.**              | astringent, antidiarrheal agent, anti-inflammatory | Radix folium et fructus Rubus fruticosi |
| **Solanum nigrum L.**             | spasmolytic, sedative, anesthetic | Herba Solani nigri                 |
| **Teucrium polium L.**            | constipative, haemostatic action, disinfecting | Herba Teucrri                      |
| **Teucrium chamaedrys L.**        | anti-inflammatory, anesthetic, astringent, antidiarrheal agent | Herba Teucrri                      |
| **Ulmus minor Mill.**             | astringent, antidiarrheal agent, anti-inflammatory | Cortex Ulmi                        |

**Plants Used for Treatment of the Liver and Biliary Tract**

| Plant Name                        | Activity                          | Part Used                          |
|----------------------------------|-----------------------------------|------------------------------------|
| **Cichorium inthybus L.**         | appetite exciting, diuretic, stimulates the release of bile | Radix Cichorii                     |
| **Mentha aquatica L.**            | spasmolytic, carminative, antiseptic | Folium Menthae aquaticae           |
| **Mentha pulegium L.**            | spasmolytic, carminative, antiseptic | Folium Menthae pulegiumae          |
| **Rumex crispus L.**              | stimulates the release of bile, laxative, | Radix et folium Rumicis crispis |
| **Rumex acetosella L.**           | stimulates the release of bile, laxative | Radix et folium Rumicis acetosellis |
| **Rumex hydrolapathum Huds.**     | stimulates the release of bile, laxative | Radix et folium Rumicis hydropalathumis |
| **Taraxacum officinalis Veb.**    | stimulates the release of bile, diuretic | Herba et Radix Taraxaci            |

**Plants Used for Treatment of Respiratory Diseases**

| Plant Name                        | Activity                          | Part Used                          |
|----------------------------------|-----------------------------------|------------------------------------|
| **Althea officinalis L.**         | expectorant, anti-inflammatory     | Radix Althaeae                      |
| **Anacamptis pyramidalis (L.) Rich.** | expectorant, anti-inflammatory | Tuber Salep                        |
| **Angelica sylvestris L.**        | expectorant, stimulates sweating, spasmolytic, diuretic | Rhizoma et radix Angelicae sylvestris |
| **Glaucium flavum Crantz.**       | cough suppressant                  | Herba Glauci flavi                  |
### Biodiversity and Healing Activities of Medicinal Plants in the Area of Kamchia Nature Complex

| Plant Name                                                                 | Activity                                | Part Used                          |
|---------------------------------------------------------------------------|-----------------------------------------|------------------------------------|
| *Hedera helix* L.                                                        | anti-inflammatory, expectorant, broncholytic | Folium Hedere helicis              |
| *Himantoglossum hircinum* (L.) Spreng.                                    | expectorant, anti-inflammatory          | Tuber Salep                        |
| *Inula helenium* L.                                                      | anti-inflammatory, expectorant, anthelmintic | Radix Inulae helenii              |
| *Iris pseudacorus* L.                                                    | expectorant, anti-inflammatory, analgetic | Rizoma Iridis                      |
| *Iris pumila* L.                                                         | anti-inflammatory                       | Rhizoma Iridis                     |
| *Lysimachia nummularia* L.                                                | expectorant, diuretic                   | Radix et flos Primulae             |
| *Orchis purpurea* Huds.                                                   | expectorant, anti-inflammatory          | Tuber Salep                        |
| *Paliurus spina-christi* Mill.                                            | expectorant, anti-inflammatory, spasmyolytic | Fructus Paliuri                  |
| *Papaver rhoeas* L.                                                      | expectorant                             | Flos Rhoeados                      |
| *Platanthera bifolia* Rich.                                              | expectorant, anti-inflammatory          | Tuber Salep                        |
| *Primula acaulis* (L.) Grubb.                                            | expectorant, diuretic, sedative         | Radix et flos Primulae             |
| *Pulmonaria officinalis* L.                                               | expectorant, anti-inflammatory          | Herba Pulmonariae                  |
| *Saponaria officinalis* L.                                               | expectorant, diuretic, stimulation of sweat | Radix Saponariae rubrae          |
| *Senecio jacobaea* L.                                                    | spasmyolytic, antiasthmatic             | Rhizoma et Herba                   |
| *Siderites montana* L.                                                   | expectorant                             | Herba Sideritis montanae           |
| *Sisymbrium officinale* (L.) Scop.                                       | expectorant, diuretic                   | Herba Sisymbrili                   |
| *Trifolium arvense* L.                                                   | expectorant, haemostatic action, diuretic, anti-inflammatory | Herba et flos Trifolii arvensis   |
| *Trifolium pratense* L.                                                  | expectorant, haemostatic action, diuretic, anti-inflammatory | Herba et flos Trifolii pratensis  |
| *Verbascum phlomoides* L.                                                | expectorant, anti-inflammatory          | Flos Verbasci                      |
| *Verbascum phoeniceum* L.                                                | expectorant, expectorant, anti-inflammatory | Flos Verbasci                   |
| *Veronica anagalis-aquatica* L.                                          | broncholytic, expectorant, anti-inflammatory | Herba Veronicae                  |
| *Veronica arvensis* L.                                                   | expectorant, anti-inflammatory          | Herba Veronicae                    |
| *Veronica austriaca* L.subsp. jacquinii (Baumg.) Maly                    | broncholytic, expectorant, anti-inflammatory | Herba Veronicae                  |
| *Veronica beccabunga* L.                                                 | broncholytic, expectorant, anti-inflammatory | Herba Veronicae                  |
| *Viola odorata* L.                                                       | expectorant, diuretic                   | Radix, rhizoma, herba et flos Violae |

### Plants Used for Treatment of Kidney and Urinary Tract Diseases

| Plant Name                          | Activity  | Part Used                          |
|-------------------------------------|-----------|------------------------------------|
| *Alisma plantago-aquatica* L.       | diuretic  | Rhizoma Plantaginis aquatica       |
| Plant Name                  | Actions                                     | Part Used                        |
|----------------------------|---------------------------------------------|----------------------------------|
| Anagalis arvensis L.        | diuretic, expectorant, anti-inflammatory    | Herba Anagallididis              |
| Arctium lappa L.            | diuretic, anti-ulcer                        | Radix Bardanae                   |
| Arctium tomentosum Mill.    | diuretic, anti-ulcer                        | Radix Bardanae                   |
| Asperula odorata L.         | diuretic, stimulation of sweat, expectorant | Herba Asperulae                  |
| Astragalus glycyphyllos L.  | diuretic, anti-inflammatory, antihypertensive| Herba Astragali glycyphylli      |
| Cynodon dactylon L.         | diuretic, laxative                          | Rhizoma Graminis italicici      |
| Eryngium campestrum L.      | diuretic, spasmolytic                       | Radix Eringii                   |
| Eryngium maritimum L.       | diuretic, spasmolytic                       | Radix Eringii                   |
| Fragraea vesca L.           | diuretic, anti-inflammatory, anti-atherosclerosis activity| Fructus et folium Fragariae     |
| Galium palustre L.          | astringent, anti-inflammatory, antimicrobial, laxative | Herba Galii palustri            |
| Galium aparine L.           | diuretic, laxative, pain reliever           | Herba Galii aparinis            |
| Oenanthe aquatica (L.) Poir.| diuretic, spasmolytic, expectorant         | Fructus Phellandrii             |
| Ononis spinosa L.           | diuretic, anti-inflammatory                 | Radix Ononisidis                |
| Physalis alkekengii L.      | diuretic, anti-inflammatory                 | Fructus Alkekengi               |
| Polygonum aviculare L.      | diuretic, astringent, haemostatic action    | Herba Polygoni avicularis        |
| Populus tremula L.          | diuretic, antiseptic                        | Gemma Populi                    |
| Populus nigra L.            | diuretic, antiseptic                        | Gemma Populi                    |
| Prunella vulgaris L.        | pain reliever, diuretic                     | Herba Prunellae vulgaris        |
| Ruscus aculeatus L.         | diuretic, astringent, antihemorrhoid        | Rhizoma et radix Rusci          |
| Sambucus ebulus L.          | diuretic, antiseptic, expectorant           | Radix, fructus et flos Ebuli     |

**Plants Used for Treatment of Rheumatic Diseases and Colds**

| Plant Name                  | Actions                                     | Part Used                      |
|----------------------------|---------------------------------------------|--------------------------------|
| Colchicum autumnale L.      | antitumor action, pain reliever             | Bulbo-tuber Colchici           |
| Filipendula vulgaris Moench | anti-rheumatic, diuretic                    | Herba Filipendulae             |
| Phytolacca americana L.     | anti-inflammatory, anti-rheumatic, laxative | Radix et folium Phytolaccae    |
| Salix alba L.               | antipyretic, anti-rheumatic                 | Cortex Salicis                 |
| Sambucus nigra L.           | stimulation of sweat, diuretic              | Flores et fructus Sambuci      |
| Sambucus racemosa L.        | anti-inflammatory, antioxidant action       | Radix et Fructus Sambuci       |
| Sinapis arvensis L.         | skin-warming action                         | Semen Sinapis arvensae         |
| Smilax excelsa L.           | influenza, antipyretic                      | Herba Smilax exelsi            |
| Solanum dulcamara L.        | stimulation of sweat, anti-inflammatory, diuretic, laxative | Herba Dulcamarae               |
| Sorbus torminalis (L.) Crantz| anti-rheumatic, astringent, diuretic        | Fructus Sorbi torminalae       |
### Biodiversity and Healing Activities of Medicinal Plants in the Area of Kamchia Nature Complex

| Plant Name                      | Activity/Use                                                                 | Herbarium                                  |
|--------------------------------|----------------------------------------------------------------------------|--------------------------------------------|
| *Verbena officinalis* L.       | stimulation of sweat, antipyretic, sedative                                | Herba Verbenae                             |
| *Xanthium spinosum* L.         | anti-rheumatic, anti-inflammatory                                          | Herba et fructus Xanthii spinosi           |
| *Xanthium strumarium* L.       | anti-rheumatic, anti-inflammatory                                          | Herba et fructus Xanthii strumarii         |

#### Plants Used for Treatment of Metabolic and Endocrine Diseases

| Plant Name                      | Activity/Use                                                                 | Herbarium                                  |
|--------------------------------|----------------------------------------------------------------------------|--------------------------------------------|
| *Galega officinalis* L.         | hypoglycaemic, diuretic                                                    | Herba Galegae                               |
| *Lemma minor* L.                | antipyretic, anti-inflammatory, stimulates the release of bile              | Herba Lemnae                                |
| *Lepidium ruderale* L.          | antidiabetic, stimulation of sweat, diuretic, sedative                      | Herba Lepidii                               |
| *Xeranthemum annuum* L.         | antiviral action, antibacterial, antimycotic, strengthens the immune system | Herba Xeranthemii                           |

#### Plants Used for Treatment of Parasitic Diseases

| Plant Name                      | Activity/Use                                                                 | Herbarium                                  |
|--------------------------------|----------------------------------------------------------------------------|--------------------------------------------|
| *Artemisia campestris* L.       | anthelmintic                                                               | Herba Artemisiae                           |
| *Artemisia santonicum* L. subsp. | anthelmintic                                                               | Herba et radix Artemisiae                  |
| patens (Neibr.) K.Pers.         |                                                                            |                                            |
| *Daucus carota* L.              | anthelmintic, source of vitamin A                                          | Radix et semen Dauci                       |
| *Pteridium aquilinum* (L.) Kuhn.| anthelmintic                                                               | Rhizoma et folium Aquilinae                |
| *Tanacetum vulgare* L.          | anthelmintic, antiseptic, spasmytotic                                       | Herba Tanaceti vulgare                     |

#### Plants That Affect the Central Nervous System

| Plant Name                      | Activity/Use                                                                 | Herbarium                                  |
|--------------------------------|----------------------------------------------------------------------------|--------------------------------------------|
| *Conium maculatum* L.          | pain reliever                                                              | Fructus et Herba Conii                     |
| *Consolida regalis* S. F. Gray  | curare-like action                                                         | Herba et semen Consolidae                  |
| *Humulus lupulus* L.            | sedative                                                                   | Strobuli Lupuli                            |
| *Leucojum aestivum* L.          | improves neuromuscular conduction, curare-like action                      | Herba Leucoji aestivi                      |
| *Melilotus alba* Med.           | sedative                                                                   | Herba Meliloti                              |
| *Melilotus officinalis* (L.) Pall.| sedative                                                                 | Herba Meliloti                              |
| *Scutellaria altissima* L.      | spasmyotic, astringent, diuretic, sedative                                 | Herba Scutelarii                           |
| *Valeriana officinalis* L.      | sedative, spasmyotic, hypotensive                                          | Radix et rhizoma Valerianae                |

#### Plants with a Predominantly Haemostatic Action

| Plant Name                      | Activity/Use                                                                 | Herbarium                                  |
|--------------------------------|----------------------------------------------------------------------------|--------------------------------------------|
| *Acer tataricum* L.             | astringent, anti-inflammatory                                              | Folium Aceri tatarici                      |
| *Bidens tripartita* L.          | astringent, diuretic, stimulation of sweat, expectorant                   | Herba Bidentis                              |
| *Capsella bursa-pastoris* (L.) Medicus.| haemostatic action                                                        | Herba Bursae – pastoris                    |
| *Erodium cicutarium* (L.) L Her.| haemostatic action                                                         | Herba Erodii cicutarii                     |
| *Loranthus europaeus* L.        | antihemorrhoidal                                                           | Herba Loranthi                              |
| Plant Name | Action Details | Part Used |
|------------|----------------|-----------|
| *Lythrum salicaria* L. | astringent, haemostatic action, antiseptic, anti-diarrheal agent | Herba Salicariae |
| *Lythrum virgatum* L. | astringent, haemostatic action, antiseptic, anti-diarrheal agent | Herba Salicariae |
| *Persicaria hydropiper* (L.) Opiz. | haemostatic action | Herba Polygoni hydropiperis |
| *Persicaria maculata* (Raf.) S.F.Gray | haemostatic action | Herba Polygoni hydropiperis |
| *Quercus cerris* L. | astringent, haemostatic action, anti-inflammatory | Cortex et fructus Quercus |
| *Quercus frainetto* Ten. | astringent, haemostatic action, anti-inflammatory | Cortex et fructus Quercus |
| *Sangusorba minor* Scop. | haemostatic action, astringent, anti-inflammatory, constipative | Rhizoma et radix Sanguisorbe |
| *Sanquisorba officinalis* L. | haemostatic action, astringent, anti-inflammatory, constipative | Rhizoma et radix Sanguisorbe |
| *Urtica dioica* L. | haemostatic action, diuretic | Folium Urticae |
| *Viburnum opulus* L. | haemostatic action, sedative | Cortex et extractum Viburni fluidum |
| *Aristolochia clematitis* L. | wound healing | Radix, rizoma et herba Aristolochiae clematitis |
| *Caltha palustris* L. | anti-inflammatory, anesthetic | Herba Calthae palustris |
| *Hypericum perforatum* L. | anti-inflammatory, astringent, anti-ulcer, haemostatic action, sedative, wound healing | Herba Hyperici |
| *Plantago major* L. | anti-inflammatory, expectorant, laxative, anti-ulcer, diuretic | Folium et herba Plantaginis majoris |
| *Plantago arenaria* W. et K. | anti-inflammatory, expectorant, anti-ulcer, | Folium et herba Plantaginis arenariae |
| *Plantago lanceolata* L. | anti-inflammatory, expectorant, anti-ulcer, | Folium et herba Plantaginis lanceolatae |
| *Stachys recta* L. | regenerative, antispastic | Herba Stachi rectae |
| *Symphytum officinale* L. | wound healing, anti-ulcer | Radix Symphyti |

**Plants Used in Skin Diseases**

| Plant Name | Action Details | Part Used |
|------------|----------------|-----------|
| *Bellis perennis* L. | wound healing, expectorant, | Flores Bellidis perennis |
| *Clematis vitalba* L. | anti-inflammatory, antimicrobial, wound healing | Radix folium et flos Clematidis vitalbae |
| *Euphorbia amygdaloides* L. | keratolytic | Succus Euphorbiae |
| *Euphorbia myrsinites* L. | keratolytic | Succus Euphorbiae |
| *Fagus orientalis* Lipsky | antiseptic, antimycotic | Pix, Fructus et folium |

**Plants with Other Types of Actions**

| Plant Name | Action | Part Used |
|------------|--------|-----------|
| *Anthemis tinctoria* L. | hair bleaching | Fructus, folium et cortex Anthemis tinctorii |
| *Butomus umbellatum* L. | nutrient | Rizoma Butomi |
fifth of the featured medicinal plants, are used mainly for treatment of gastrointestinal diseases and respiratory diseases.

Different morphological and generative parts of the established medicinal plants are used as plant substances. The species in which the above ground portion of the plant is collected for its plant substance dominate the rest and constitute half of the established for the area medicinal plants. One third of the species can be collected and used for different plant parts.

**CONCLUSION**

Survey results reveal a considerable variety of medicinal plants in Kamchia Natural Complex area. They represent an integral part of the country’s resource of medicinal plants. Their presence enhances and highlights floodplain forest’s significance, manifests the uniqueness of coastal sands and dunes as habitats with priority conservation status. The established medicinal plants feature a variety of healing activities and are applicable for a wide range of diseases. Findings suggest further resource-based research in view of their protection and rational use.

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