Abstract: The present exploration encompasses in-depth investigation on Ethnobotanical plants used as Ethno-veterinary medicine in the district of Burhanpur M.P., India. The present exploration revealed that 45 ethno-veterinary medicinal plants belonging to 43 genera under 29 families are used by tribals of Satpura range of Burhanpur district. Authors found that they are habitual to use plant parts in different formulations, leaves are predominantly used, followed by fruits, roots/ rhizomes, stem and bark.

Keywords: Burhanpur, Ethno-veterinary, Medicinal Plants, Satpura forest range.

INTRODUCTION
Domestic animals play a very significant role in human civilization. Bio resources and humans have intimate relationship since past and depend upon each other for existence. In Indian subcontinent, the plants have played crucial role in the socio-cultural development of human race concurrently in different parts of human civilization and exerted larger impact because of varied climatic conditions and diversified socioeconomic conditions (Pandey, 2019). The traditional medicine is not only a source of healing, but the practice is also an important part of their religion and culture (Sharma and Pareek, 2021). So far as modern medicine is concerned, it is reported that more than half of the world’s modern drugs are of biological sources (Prakash and Prakash, 2021; Prakash and Verma, 2021). Jain et al. (2006) reviewed the medicinal flora of Madhya Pradesh and Chattisgarh. Some indigenous plants act as anticancer agents (Prakash and Upadhyay, 2021).

Now day's importance of immunity booster plants and their products are continuously being enhanced since first wave of COVID-19, which has now been declared pandemic (Kumari and Shukla, 2020; Verma and Prakash, 2020; Balwan et al., 2021). Allium sativum, Piper nigrum, Curcuma longa, Zingiber officinale, Nigella sativa and Syzygium aromaticum and so many plants are used by rural and urban people to enhance the immunity in order to get protection from COVID-19 pandemic (Rao, 2021).

The knowledge of traditional medicine is mostly less documented and is transmitted orally from generation to generation thereby restricted to a particular practicing family, tribe, or section of society, which has led them to
the verge of extinction. Since due to various reasons, both natural resources and tribal culture are depleting at an alarming rate, therefore, there is an urgent need to explore and document this unique and indigenous knowledge before it is lost forever (Prakash, 2017; Prakash and Yadav, 2020). As far as studies on Ethnoveterinary medicinal plants of Burhanpur district (M.P.) is concerned, there are no availability of authentic reports. Hence, it is felt worthwhile to bring a comprehensive account on Ethnoveterinary medicinal plants of Burhanpur district.

MATERIALS AND METHODS

The study covers the areas of Satpura region of Burhanpur district of Madhya Pradesh literally means ‘Central Province’, and is located in the geographic heart of India, between latitude 21.2°N-26.87°N and longitude 74°02'-82°49' E. The state straddles the Narmada River, which runs east and west between the Vindhya and Satpura ranges. These ranges and the Narmada are the traditional boundary between the north and south of India. Within the forest, 26.49% of the population in Burhanpur district belongs to ST and 8.87% belongs to SC.

All the botanical explorations were carefully planned, so that as far as possible all the rounds of various forest ranges could be explored. During 2018-2020, each trip, notes related to habit, habitat, association, flower and fruit color, ethnoveterinary uses and other characters were entered in a field book. Careful attention was paid to search and collect the ephemeral plants in the region, especially during monsoon season. Plants were collected with the help of local men expert in medicine, flowers were preserved in 4% Formalin for further study and preparations of herbarium specimens and identified with the help of Flora and other literature (Jain and Rao, 1977; Chopra, et al., 1956; Cookie, 1957; Haines, 1974; BSI, 1993, 1997, 2001).

ETHNO-VETERINARY MEDICINAL PLANTS

Authors collected a data of 45 ethnoveterinary medicinal plants belonging to 43 genera under 29 families, which are used by tribals of Satpura range of Burhanpur district. A list of these plants with family names, ailments, plant parts used and mode of administration are given in table 1.

Table 1: Ethnoveterinary medicinal plants.

| S. No. | Plant name with family | Name of ailments | Parts of plants | Mode of administration |
|-------|------------------------|------------------|----------------|------------------------|
| 1.    | *Abutilon indicum* (L.) Sweet, Hort. (Malvaceae) | Galactagogue | Roots | 100g roots chopped with fodder to fed animals as galactagogue. |
| 2.    | *Acacia nilotica* Linn. (Fabaceae) | Jaundice, Dysentery | Flower, Bark | About 200g flowers grinded well and mixed with 250 ml of water; the mixture given orally twice daily for 15-20 days to cure jaundice. The extract of bark is given to animal orally twice a day for 10-20 days to cure dysentery. |
| 3.    | *Adhatoda vasica* Nees. (Acanthaceae) | Diarrhoea and Dysentery | Leaf, Bark | Half cup leaf juice is mixed with equal amount of bark juice of *Syzygium cumini*; administered thrice a day for one week to treat diarrhoea and dysentery. |
| 4.    | *Aegle marmelos* (L.) Correa (Rutaceae) | Sun burn | Leaf, Seed | About 500g fresh leaves are taken to form a paste by grinding and mixed with 100 ml seed oil of *Ricinus communis*. This paste is applied over skin affected till the rest from sun burn. |
| 5.    | *Albizia lebbeck* (L.) Benth. (Leguminosae) | Galactagogue | Fruits | 100g fruits chopped with fodder to fed animals as galactagogue. |
| 6.    | *Alternanthera sessilis* (L.) R. (Amaranthaceae) | Galactagogue | Whole plant | 100g roots chopped with fodder to fed animals as galactagogue. |
| 7.    | *Allium cepa* Linn. (Amaryllidaceae) | Removal of Ectoparasites And Cough | Bulb, Leaf | Bulb of onion is grinded well and mixed with 100 ml of mustard oil and 25g leaf ash of Musa paradisiaca. The mixture so obtained is externally applied on the skin for removal of the ectoparasites. Bulb paste mixed with mustard oil and administered thrice daily for one month. |
|   | botanical name | part | description  |
|---|----------------|------|-------------|
| 8. | **Amaranthus spinosus** L. (Amaranthaceae) | Galactagogue | Whole Plant | Whole plant chopped with fodder to fed animals as galactagogue. |
| 9. | **Amorphophallus konkanensis** Hett. (Araceae) | Galactagogue | Corm | 50g corm paste mixed with flour of wheat or jowar and fed to milch animals to increase milk yield. |
| 10. | **Ampeilocissus latifolia** (Roxb.) Planch. (Vitaceae) | Galactagogue | Roots | 100g root paste mixed with flour of Jowar and fed to milch animals for three days to increase milk yield. |
| 11. | **Asparagus racemosus** Wild. (Liliaceae) | Arthritis | Root | About 500g root powder given with milk for one month for the treatment of arthritis in cattle. |
| 12. | **Argemone mexicana** Linn. (Papavaraceae) | Foot infection, Rheumatism | Leaf and Fruit | The juice extracted from leaves (100 g) and fruits (100 g), is applied over feet suffering from infections. Same juice is also applied over body parts for relieving rheumatic pain. |
| 13. | **Azadirachta indica** Juss. (Meliaceae) | Wound | Bark | About 500g bark of Azadirachta indica and 250g bark of Acacia nilotica is grinded and mixed with water; the paste so obtained is applied over wounds till complete recovery. |
| 14. | **Bambusa arundinacea** Wild. (Poaceae) | Easier delivery, Diarrhoea | Leaf, Rhizome | The leaves (200g) are given to pregnant buffalo for a month twice a day to easier delivery. The paste prepared from equal amount of rhizome and fresh leaf is given twice a day for 7 days to the cattle suffering from diarrhoea. |
| 15. | **Butea monosperma** (Lam.) Taub. (Fabaceae) | Dysurea, Paralysis | Flowers | Decoction of flowers is given to the cattle thrice a day for one month for the treatment of dysuria and paralysis. |
| 16. | **Calotropis procera** (L.) R. Br (Asclepiadaceae) | Easier delivery | Flowers | The paste of flower (50g) mixed along with jaggery (100g) and given to animal for easier delivery. |
|   | | Snake bite | Latex | Milky latex of plants is applied externally on snakebite to neutralized poison. |
| 17. | **Cassia fistula** Linn. (Fabaceae) | Indigestion | Pods | The paste of pods is given twice a day along with wheat bread to cattle in the case of indigestion. |
|   | | Improve appetite | Leaves | The paste of leaves is mixed along with mustard oil and given twice a day for five days to improve appetite. |
|   | | As purgative / to release constipation | Leaves and ripe pods | The young leaves are cooked and given as purgative. Paste of ripe pods is also administered for purgative purpose. |
| 18. | **Coriandrum sativum** Linn. (Apiaceae) | Loose motion | Seeds and Leaves | The seed powder is mixed with leaves paste of Lawsonia inermis and given twice a daily for seven days to cure loose motion. |
| 19. | **Cynodon dactylon** (Linn.) Pers. (Poaceae) | Increasing lactation | Aerial plant | The 30g aerial plant is given as fodder for increasing lactation and milk quality. |
|   | | Conjunctivitis | Leaves | One teaspoonful leaf juice is dropped in each eye in the morning for three days for the treatment of conjunctivitis. |
| 20. | **Dalbergia sissoo** Roxb. (Fabaceae) | Hemorrhage | Leaves | Juice of 100g leaves is given twice or thrice in a day for one week to stop bleeding effectively. |
| No. | Scientific Name | Part/s | Use |
|-----|----------------|--------|-----|
| 21. | *Datura metal* Linn. (Solanaceae) | Cold | Ripe fruits | About 100g are ripe frits are made in to paste and given to cattle once daily for seven days to cure cold. |
|     |                | Wounds | Leaves | A paste is prepared from 300g fresh leaves and 200g roots and given to animals once daily for 7 days to stop bleeding from the wounds and early healing. |
| 22. | *Delonix regia* Linn. (Fabaceae) | Fever | Bark | Extract of bark is given with black pepper and garlic twice daily to cure fever. |
| 23. | *Eclipta prostrala* Linn. (Asteraceae) | Wounds | Leaves | Fresh leaves are grinded and boiled with mustard oil. The paste is applied twice daily for 10-15 days on wounds for early healing. |
| 24. | *Feronia elephantum* Linn. (Rutaceae) | Intestinal worm | Leaves | Fresh leaves are grinded well and mixed with 500 ml of water and given to cattle once daily for 10-20 days in case of intestinal worm. |
| 25. | *Ficus benghalensis* Linn. (Moraceae) | Stomachache | Root | About 100g root is grinded well and given once daily for 3-4 days to cattle suffering from stomachache. |
| 26. | *Ficus religiosa* Linn. (Moraceae) | Tonsils | Leaves | The juice of leaves is used to cure tonsils. |
| 27. | *Hibiscus rosa-sinensis* L. Malvaceae | Twitching | Bark | 150-200g bark is grinded well and given with one liter of water, twice daily in case of twitching. |
| 28. | *Holoptelia integrifolia* Planch. Ulmaceae | Removal of ecto-parasites | Leaves | Leaf juice is applied on the skin for removal of ecto-parasites. |
| 29. | *Madhuca indica* J.F. Gmel ( Sapotaceae) | Fever | Flowers | 100g flower paste, 250g jaggery and 50 ml water is mixed and given twice a daily for seven days to cure fever of cattle. |
| 30. | *Mangifera indica* Linn. (Anacardiaceae) | Indigestion | Fruits | The paste is obtained from 250g fruit and given along with wheat bread twice a daily for seven days to cattle to cure indigestion. |
| 31. | *Mentha arvensis* Linn. (Lamiaceae) | Fever | Leaves | The paste is obtained from 250g leaves of *Mentha arvensis* and 200g leaves of *Centella asiatica* and given to cattle twice in a day for 7 days to cure fever. |
| 32. | *Moringa oleifera* Lamk. (Moringaceae) | Diarrhoea, Dysentery, Rheumatism, Ulcer | Leaves | 200g leaf paste is given twice daily for three days to cattle for quick relief from diarrhea and dysentery. |
|     |                | | | The paste is prepared from 400g pods and given approximate one month for relief from rheumatism. |
|     |                | | | Juice of the roots is applied on the ulcers of cattle for healing and expels larvae of insects from it. |
| 33. | *Musa paradisica* Linn. (Musaceae) | Body heat | Leaves | Young leaves and roots are given with fodder for one week to reduce body heat. |
| 34. | *Ocimum sanctum* L. (Lamiaceae) | Cough, Cold | Leaves | 300g fresh leaf of *Ocimum sanctum* is boiled with 200 ml water and the decoction is given to cure cough and cold. |
| 35. | *Ocimum gratissimum* L. (Lamiaceae) | Removal of ecto-parasites | Leaves | Leaf paste is applied externally on skin of cattle for removal of ecto-parasites. |
| 36. | *Oryza sativa* L. (Poaceae) | To enhance lactation | Grains | Grains are cooked along with black gram and salts. The recipe so prepared is given once or twice in a day for one month to enhance lactation in cattle. |
| 37. | *Psidium guajava* L (Myrtaceae) | Fever | Leaves | One liter decoction of fresh leaves is given twice daily to cure fever. |
### Medicinal Plants and Their Uses

| No. | Plant Name          | Condition       | Part Used         | Preparation                                                                 |
|-----|---------------------|-----------------|-------------------|----------------------------------------------------------------------------|
| 38  | *Ricinus communis*  | Constipation    | Seeds             | An about 50g seed is given orally with fodder for 7 days in case of constipation of cattle. |
| 39  | *Syzygium cumini*   | Joint pains     | Bark              | Equal amount of bark of *Syzygium cumini* and *Azadirachta indica* is boiled in water and the decoction prepared is spread on the affected joints to release joints pains. |
| 40  | *Tamarindus indica* | Swelling        | Leaves            | The fresh leaves, about 200g are boiled in water and these leaves are tie up on affected part of body to cure swelling till the complete relief. Tongue sores | Fruits | A paste is prepared from ripe fruits and mixed with *Allium sativum*. The paste mixed with mustard oil and applied on the tongue sores. |
| 41  | *Tagetes erecta*    | Hydrophobia     | Leaves            | Decoction of 50g leaves are given once in a day for a month to cattle suffering from hydrophobia. |
| 42  | *Tribulus terrestris* | Colic, Cough    | Leaf              | Juice of fresh leaves is given to animals in case of colic and chronic cough. |
| 43  | *Trigonella foenum-graecum* | Easier delivery | Seeds | About 100g sprouted seeds are given to pregnant animal once daily for one month for easier delivery. Twitching | Seeds | About 25g dried seeds powdered and given twice daily for 5 to 7 days to animal suffering from twitching. |
| 44  | *Zingiber officinale* | Physically disability | Rhizome | About 100g fresh rhizomes are boiled in half liter of cow milk and given to physically disable animal twice a day for 15 days. |
| 45  | *Vitex negundo*     | Diarrhea        | Leaf              | Dried leaves mixed with fodder and given to the cattle for one week to cure diarrhea. |

In this way, authors compiled first-hand information on the Ethno-veterinary medicinal plants used by tribals, another rural folklore people of the district Burhanpur. Healers never charged any fee for treatment; however, they ask farmers to bring additives like pepper, chilies, curcuma powder, jaggery etc. while preparing medicine. A total of 45 remedies were recorded for veterinary diseases of which 33 remedies were recorded under digestive disorders, 3 stomach pain and 3 for constipation.

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**REFERENCES**

1. Balwan W.K., Balwan W.K. and Saba N. (2021). Decoding the role of community and social medicine during Covid-19 pandemic. *International Journal of Biological Innovations*. 3(2):360-366. https://doi.org/ 10.46505/ IJBI.2021.3217
2. BSI (1993). Flora of M. P. Vol. I: Pteridophytes and Angiosperms. Botanical Survey of India, Calcutta.
3. BSI (1997). Flora of M. P. Vol. II: Angiosperms. Botanical Survey of India, Calcutta.
4. BSI (2001). Flora of M. P. Vol. III: Angiosperms and Gymnosperms. Botanical Survey of India, Calcutta.
5. Chopra. R.N., Nayar S. L. and Chopra I.C. (1956). Glossary of Indian medicinal plants, C.S. I.R. New Delhi.
6. Cookie T. (1957). Flora of the Presidency of Bombay, vol.1–II.
7. Haines H.H. (1974). The Botany of Bihar and Orissa, part VI.
8. Jain S. K. and Rao R. R. (1977). A handbook of field and herbarium method, today and tomorrow. Oxford and IBH Publishing Company, New Delhi.
9. Jain J.B., Kumane S.C. and Bhattacharya S. (2006). Medicinal flora of Madhya Pradesh and Chattisgarh-A Review. *Indian Journal of Traditional Knowledge*. 5(2):237-242.
10. Kumari T. and Shukla Vineeta (2020). Covid-19:
Towards Confronting an Unprecedented Pandemic. *International Journal of Biological Innovations*. 2(1):1-10. https://doi.org/10.46505/IJBI.2020.2101

11. Pandey H. P. (2019). Socio-religious Plants of Terai Region of U.P., India. *International Journal of Biological Innovations*. 1(1): 18-22. https://doi.org/10.46505/IJBI.2019.1104

12. Prakash S. (2017). Medico-ethnozoological studies on homoeothermic vertebrates of Devipatan division of Uttar Pradesh, India. *International Journal of Fauna and Biological Studies*. 4(6): 62-66.

13. Prakash Sudhakar and Prakash S. (2021). Ethnomedicinal use of fishes by tribal communities in India: A review. *The Pharma Innovation Journal*. 10(5): 1315-1321. 10.22271/tpi.2021.v10.i5q.6395

14. Prakash S. and Upadhyay S.K. (2021). A Study on Indigenous plants as source of Anticancer Agents: An Ethnomedicinal Approach. *Asian Journal of Biological and Life Sciences*. 10(2):359-365.

15. Prakash S. and Yadav D. K. (2020). Medico ethnozoological studies on anamniotes fauna of Devipatan division of Uttar Pradesh, India. *International Journal of Zoology and Applied Biosciences*. 5(5): 222-227.

16. Prakash S. and Verma A. K. (2021). Relevance of Ethnomedicines of Invertebrate origin used by Tribals at Indo-Nepal Border. *International Research Journal of Biological Sciences*. 10(1): 36-39.

17. Rao J.K. (2021). Some Ethno-medicinal plants of Uttar Pradesh: A Review. *International Journal of Biological Innovations*. 3 (2): 291-296. https://doi.org/10.46505/IJBI.2021.3207.

18. Sharma N. and Pareek A. (2021). Ethnobotanical properties of plants used by the rural community of Dausa District of Rajasthan, India. *International Journal of Biological Innovations*. 3 (1): 179-185. https://doi.org/10.46505/IJBI.2021.3118.

19. Verma A.K. and Prakash S. (2020). Impact of Covid-19 on Environment and Society. *Journal of Global Biosciences*. 9 (5): 7352-7363.