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# Floral bio-indicator of natural salt lick: keys for the wildlife management in mining areas

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## ABSTRACT

Wildlife management & restoration of habitat is difficult in mining areas. The continuous extension of mining activities in a particular landscapes are causes for the loss of wildlife population followed by extinction in mining areas. Urgent restoration programs are needed in mining areas using different ecological aspects. Keeping the importance of restoration in mining areas, an attempt has been carried out to enumerate the ground floral species available in & around natural salt lick areas of Koira Range, Bonai Forest Division, Odisha, India. The results revealed that 27 species are enumerated from nine natural salt lick areas. The common enumerated species are *Lindernia crustacea, Lindernia ciliata, Desmodium triflorum, Eriocaulon quinquangulare* and *Murdannia nudiflora*. The present study recommends the restoration of enumerated plant species along with food species of available herbivorous including Asian Elephant to balance the ecological systems and food chain in mining areas to avoid the conflicts.

**Keywords**: Restoration, wildlife management, mining areas, bio-indicator

## 1. INTRODUCTION

Bonai Forest Division, Sunargarh is rich with floral and faunal species (Kumar and Kumar 2021). It is also known for its mineral deposition and mining activities. The biowealth of Barsuan and Koira Ranges of Bonai Forest Division are much affected due to mining activities. Both ranges are home of diverse wildlife and floral species. From the last decades, the human-wildlife conflicts have increased due to lack of food species, habitat destruction and mining activities in their natural habitat. It cannot fix in a day but try to restore the available wildlife in nearby habitat which is free of mining activities. For such restoration need to restore the habitat through plantation of food plants, ecologically important plants, restoration of wetland, restoration of natural saltlick etc. Keeping this in view, an attempt has been taken to enumerate the herbaceous plants near salt lick areas in Koira range and identification of floral-bio-indicator of natural salt lick. Salt lick is also known as mineral lick. It is a natural or artificial place where wildlife gets essential mineral nutrients (Emmons and Stark 1979). These are very important for balancing of ecology but they also provide an easy way for poaching. Therefore, proper management of these natural salt licks is very important for healthy population of wildlife. The present



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study highlights the importance and urgent need of the restoration of natural salt lick along with plantation of food plants near them.

**Plate 1:** Field survey for enumeration of indicator plants



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## 2. METHODOLOGY

The survey to enumerate the herbaceous plants available near Koira range, Bonai Forest Division was carried out during October 2021 (Plate 1). The enumerated species were identified by Dr. Sanjeet Kumar, Ambika Prasad Research Foundation, Odisha. The information on plants and areas were recorded through field data book.

## 3. RESULTS AND DISCUSSION

The survey was done in nine locations of Koira range having natural & artificial salt lick. It was observed that 27 plants are enumerated belonging to 21 genus. The most common plants observed in nine locations were *Lindernia crustacea, Lindernia ciliata, Desmodium triflorum, Eriocaulon quinquangulare* and *Murdannia nudiflora*. Details are listed in Table 1 & Plate 2.

**Table 1:** The enumerated plant species available in and around salt lick

| GPS Location | Elevation (m) | Location | Plant Name | Common plant |
|---|---|---|---|---|
| 21° 05' 28" N<br>85° 16' 08" E | 687 | Mendha Maruni RF, Koira section | *Desmodium heterocarpon*<br>*Lindernia crustacea*<br>*Lindernia ciliata*<br>*Murdannia nudiflora*<br>*Sonerila tenera* | *Lindernia crustacea*<br>*Lindernia ciliata*<br>*Desmodium triflorum*<br>*Eriocaulon quinquangulare*<br>*Murdannia nudiflora* |
| 21° 52' 49" N<br>85° 15' 23" E | 753 | Bhawanipahad PRF, Jaldihi | *Drosera indica*<br>*Drosera burmannii*<br>*Stylidium tenellum*<br>*Blumeopsis flava*<br>*Sonerila tenera*<br>*Desmodium triflorum*<br>*Desmodium heterocarpon*<br>*Lindernia crustacea*<br>*Lindernia ciliata*<br>*Murdannia nudiflora* | |
| 21° 52' 35" N<br>85° 16' 31" E | 633 | Khajuridihi PRF | *Spermacoce alata*<br>*Spermacoce ocymoides*<br>*Desmodium triflorum*<br>*Eclipta prostrata*<br>*Lindernia crustacea*<br>*Lindernia ciliata*<br>*Mitrasacme indica*<br>*Murdannia nudiflora* | |
| 21° 57' 22" N<br>85° 13' 12" E | 640 | Karo RF | *Eriocaulon quinquangulare*<br>*Lindernia oppositifolia*<br>*Murdannia nudiflora*<br>*Drosera indica*<br>*Desmodium triflorum*<br>*Centranthera indica*<br>*Lindernia crustacea*<br>*Lindernia ciliata*<br>*Mitrasacme indica*<br>*Stylidium tenellum*<br>*Aeschynomene indica* | |
| 21° 57' 12" N<br>85° 13' 10" E | 665 | Karo RF | *Eriocaulon quinquangulare*<br>*Smithia conferta*<br>*Lindernia crustacea* | |



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| | | | | |
|---|---|---|---|---|
| | | | *Lindernia ciliata*<br>*Mitrasacme indica*<br>*Hoppea dichotoma*<br>*Murdannia nudiflora* | |
| 21° 56' 48"N<br>85° 11' 51"E | 621 | Samijnala, Toda RF | *Persicaria stagnina*<br>*Polygonum pubescens*<br>*Limnophila rugosa*<br>*Murdannia nudiflora*<br>*Murdannia spirata*<br>*Smithia conferta* | |
| 21° 57' 21"N<br>85° 12' 22"E | 562 | Samijnala, Toda section | *Persicaria stagnina*<br>*Polygonum pubescens*<br>*Murdannia nudiflora*<br>*Murdannia spirata*<br>*Mecardonia procumbens* | |
| 21° 52' 35"N<br>85° 16' 31"E | 586 | Khajuridihi RF | *Eriocaulonquin quangulare*<br>*Murdannia nudiflora*<br>*Utricularia caerulea*<br>*Drosera indica*<br>*Mitrasacme indica*<br>*Lindernia crustacea*<br>*Lindernia ciliata*<br>*Stylidium tenellum*<br>*Smithia conferta*<br>*Xyris indica*<br>*Desmodium triflorum* | |
| 21° 57' 16"N<br>85° 08' 57"E | 439 | Kunchpani , Jamudihi section, Toda RF | *Desmodium triflorum*<br>*Eriocaulonquin quangulare*<br>*Murdannia nudiflora*<br>*Murdannia spirata*<br>*Dopatrium junceum*<br>*Lindernia crustacea*<br>*Lindernia ciliata* | |

In 1985, Kreulen reported about the benefits and banes of soil consumption by the large herbivores. Jeremy et al., (2008) reported attendance pattern, duration of visits, time spent in licking by four ungulates in Northern British Colombia, Canada. They also reported that soil lick improve the function of rumen and help to absorb the nutrients during the transition to spring and summer forage and to supplement elemental intake by females during the nutritional stress associated with lactation.

Gilmore et al. (2020) reported about the socio-cultural significance of salt lick. They described that salt licks are culturally significant and useful to the Maijuna in diverse ways. They also reported that hunters target these areas both during the day and night, and animals killed are consumed for subsistence and sold to generate the income. No or less reports are available on study areas and Odisha state about this fact.



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**Plate 2:** The indicator plants of salt lick in study areas, A) *Eriocaulon quinquangulare*, B) *Lindernia crustacea*, C) *Lindernia ciliata*, D) *Utricularia caerulea*, E) *Drosera indica*



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## 4. CONCLUSION

Mining activities and overhunting of wild species are a major threats in the study areas. Mineral lick is a focal point of poaching. They are also a prime site for restoration of ecologically important plants in study areas for wildlife management. The strategy should be made for urgent implementation against poaching and plantation of enumerated species available in and around the salt lick along with food species of available herbivores. The enumerated species should plant near artificial salt lick too.

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**Conflicts of interests**

The authors declare that there are no conflicts of interests.

**Data and materials availability**

All data associated with this study are present in the paper.

## REFERENCES AND NOTES

1. Emmons LH and Stark NM. (1979). Elemental composition of a natural mineral lick in Amazonia. Biotropica. 11 (4): 311–313.
2. Gilmore MP, Griffihs BM and Bowler M. (2020). The socio-cultural significance of mineral licks to the Maijuna of the Peruvian Amazon: implications for the sustainable management of hunting. Journal of Ethnobiology and Ethnoedicine. 16(59): 1-10.
3. Jeremy BA, Katherine LP and Gillingham MP. (2008). Use of natural lick by four species of ungulates in Northern British Columbia. Journal of Mammalogy. 89(4): 1041-1050.
4. Kreulen DA. (1985). Lick use by large herbivores: a review of benefits and banes of soil consumption. Mammals Review. 15(3): 107-123.
5. Kumar NS and Kumar S. (2021). Taxonomic note on *Luisia zeylanica* (Orchidaceae) from Bonai Forest Division, Odisha, India. *Richardiana*. 5:142-147.



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