Biological activities of ethnomedicinal claims of some plant species of Assam

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Folklore medicinal uses and biological activities of some plant species growing wild in Assam of North-East India were studied based on the review of literature reports. An account of 65 plant species indicating positive correlation between their folklore claims and biological activities were reported in this communication. For each plant species described botanical name, local name(s), parts used and folklore claims, and biological activities were given. The present study not only revealed the authenticity of traditional knowledge of the ethnic people of Assam on utilitarian aspects of these plant species but also indicated the possibility of utilizing them for greater economic use.

Keywords: Folk medicine, Ethnomedicine, Assam

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Assam, a state in the Northeastern region of India, with an area of 78,438 km² between 88°25’-96°0’ E latitude and 24°5’-28°0’ N longitude, is the homeland of people belonging to more than 100 ethnic groups and subgroups1,2 which are still maintaining their tribal solidarities with a primitive state of economic life. Traditional agriculture is the primary means of livelihood of these people, who depend mostly on surrounding plant communities for their day-to-day needs. Hence, forest resources play an important role in the economy of these people in acquiring food, fodder, fuel and medicaments. Quite a large number of ethnobotanical studies conducted both area and plant wise have so far revealed many plant species of medicinal use from the region. However, these studies are confined mostly on tapping and documentation of folklore use only. Adequate attention has not so far been paid to study the authenticity of these folklore information, although it is an important area of medicinal plant research.

**Results**

1. **Abrus precatorius L.** (Fabaceae)
   - Local name: **Dog-Rong-Thai** (Hill tribes)
   - Folk use: Seeds consumed directly to expel unwanted embryo and also to induce sterility of women3.
   - Biological activity: Abrin-a lactin contained in the plant part possesses immunopotentating activity4.

2. **Acorus calamus** L. (Araceae)
   - Local name: **Boch** (Plain tribes)
   - Folk use: Paste of rhizome is applied in skin infection5.
   - Biological activity: The plant part possesses anti-microbial and antifungal activities6.

3. **Achyranthes aspera** L. (Amaranthaceae)
   - Local name: **Bon-Sodh** (Plain tribes)
   - Folk use: Decoction of aerial parts is taken orally to get relief from flatulence and urinary infection7.
   - Biological activity: The plant part possesses antibacterial activity7.

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Local name: *Bahaka*. (Plain tribes)  
Folk use: Decoction of leaves is taken orally in cough and asthmatic problems.  
Biological activity: The plant part possesses antiasthmatic activity.

5. *Aegle marmelos* Corr. (Rutaceae)  
Local name: *Bel* (Plain tribes)  
Folk use: Infusion of fruit is taken orally in dysentery. Decoction of leaves is taken in diabetes.  
Biological activity: Leaves possess antiviral and fruit hypoglycaemic activities.

6. *Ageratum conyzoides* L. (Asteraceae)  
Local name: *Gondhua-Bon* (Plain tribes)  
Folk use: Leaf juice is applied in cuts and wounds.  
Biological activity: The plant part possesses antibiotic activity.

7. *Alstonia scholaris* (L.) R.Br. (Apocynaceae)  
Local name: *Chatian* (Plain tribes)  
Folk use: Latex of the leaves is applied to cure boils.  
Biological activity: The plant part possesses antibacterial activity.

8. *Alternanthera sessilis* (L.) R. Br. ex DC. (Amaranthaceae)  
Local name: *Mati-Kaduri* (Plain tribes)  
Folk use: Leaves and stems are roasted and taken orally in stomach and gastric problems.  
Biological activity: The plant parts possess antiulcer activity.

9. *Andrographis paniculata* (Burm. f.) Wall. Ex Nees (Acanthaceae)  
Local name: *Chirata* (Plain tribes)  
Folk use: Leaf infusion is taken orally in fever.  
Biological activity: Extract of the plant part possesses antipyretic activity.

10. *Anisomeles indica* (L.) O. Kuntze (Lamiaceae)  
Local name: *Bontil* (Plain tribes)  
Folk use: Decoction of aerial parts is taken orally in burning sensation during urination.  
Biological activity: The plant parts possess anti-inflammatory activity.

11. *Artemisia nilagirica* (C. B. Cl.) Pomp. (Asteraceae)  
Local name: *Chirota* (Plain tribes)  
Folk use: Leaf juice is applied to cure measles.  
Biological activity: The plant part possesses antimicrobial activity.

12. *Barringtonia acutangula* (L.) Gaertn. (Barringtoniaceae)  
Local name: *Hijal* (Plain tribes)  
Folk use: Leaf infusion is taken orally in diarrhoea.  
Biological activity: Leaf extract is antiprotozoal.

13. *Bauhinia vahlii* W&A. (Caesalpiniaceae)  
Local name: *Nak-Kati-Loa* (Plain tribes)  
Folk use: Decoction of pod is taken orally in diarrhoea and dysentery.  
Biological activity: The plant part possesses antimicrobial activity.

14. *Betula alnoides* Buch-Ham. ex D. Don (Betulaceae)  
Local name: *Khringjao* and *Kadinglen* (Hill tribes)  
Folk use: Stem bark roasted in ‘ghee’ with rice powder and carum seeds is given orally to women in post natal pain and bleeding. Freshly ground stem bark is also applied in cuts, wounds, joints pain and sprains.  
Biological activity: Methyl salicylate contained in the plant part is rubifacient and analgesic.

15. *Boerhavia repens* L. var. *diffusa* L. (Nyctaginaceae)  
Local name: *Ponarnova* (Plain tribes)  
Folk use: Juice of herb is taken orally in jaundice.  
Biological activity: Plant extract possesses antiviral activity.

16. *Butea monosperma* (Lam.) O. Kuntze (Fabaceae)  
Local name: *Palash* (Plain tribes)  
Folk use: Leaf extract is taken orally in liver problems.  
Biological activity: Leaf extract possesses antimicrobial activity.

17. *Caesalpinia bonduc* (L.) Roxb. (Caesalpiniaceae)  
Local name: *Leta-Guti* (Both hills and plain tribes)  
Folk use: Seed cotyledon in the form of paste is taken orally in malarial fever.  
Biological activity: The seed extract possesses antipyretic activity.

18. *Calotropis gigantea* (L.) Ait. (Asclepiadaceae)  
Local name: *Akon* (Plain tribes)  
Folk use: Root powder is sprayed locally in leprosy and leucoderma.  
Biological activity: The plant part possesses antibacterial activity.
19. *Calotropis procera* (Ait.) R.Br. (Asclepiadaceae)
   Local name: Akon (Plain tribes)
   Folk use: Leaves in the form of paste is applied in boils and cancerous wounds.
   Biological activity: The leaf extract possesses anticancer activity.

20. *Cannabis sativa* L. (Cannabinaceae)
   Local name: Bhung-Gash (Plain tribes)
   Folk use: Leaf juice is applied in pimples, boils, cuts and wounds.
   Biological activity: The plant part possesses antibacterial activity.

21. *Cassia alata* L. (Caesalpiniaceae)
   Local name: Khor-Pat (Plain tribes)
   Folk use: Leaves in the form paste are applied locally in eczema.
   Biological activity: The plant part possesses antifungal activity.

22. *Cassia fistula* L. (Caesalpiniaceae)
   Local name: Sonaru. (Plain tribes)
   Folk use: Decoction of leaves is applied locally in leprosy.
   Biological activity: The plant part possesses antiviral, antibacterial and antifungal activities.

23. *Cassia tora* L. (Caesalpiniaceae)
   Local name: Bi-Lokhoni (Plain tribes)
   Folk use: Leaves in the form of paste are applied in skin disease.
   Biological activity: Leaf extract possesses antibacterial activity.

24. *Centella asiatica* (L.) Urban (Apiaceae)
   Local name: Bor-Manimuni (Plain tribes)
   Folk use: Leaves in the form of paste is applied locally in syphilis. Leaf paste is also applied locally in boils and tumors.
   Biological activity: Leaf extract is antibacterial.

25. *Cinnamomum assamicum* Nath & Baruah. (Lauraceae)
   Local name: Jangli-Dalchini (Plain tribes)
   Folk use: Leaves and stem bark in the form of paste are applied locally in scabies.
   Biological activity: Benzyl benzoate present in the plant parts possesses antiscabies activity.

26. *Clausena heptaphylla* (Roxb.) W & A. ex Steud. (Rutaceae)
   Local name: Nchangtabu and Arhiksi (Hill tribes), Pan-machala (Plain tribes)
   Folk use: Decoction of leaves is taken orally in fever due to jaundice.

27. *Clerodendrum colebrookianum* Walp.=C. glandulosus Coleb. ex.Wall. (Verbenaceae)
   Local name: Nefaft (Plain Tribes), Phuinum (Hill tribes)
   Folk use: Tender leaves in the form (Plain Tribes). Soup is taken orally in hypertension.
   Biological activity: Leaf extract possesses anti-hypertensive property.

28. *Costus speciosus* (Koen.) Sm. (Zingiberaceae)
   Local name: Jhom-Lakuti (Plain tribes)
   Folk use: Rhizome in the form of paste is applied locally in leprosy.
   Biological activity: Rhizome possesses anti-inflammatory activity.

29. *Curcuma longa* L. (Zingiberaceae)
   Local name: Haldi (Plain tribes)
   Folk use: Rhizome in the form of paste is applied locally in cuts and wounds.
   Biological activity: The plant part possesses antibiotic and anti-inflammatory activities.

30. *Drymaria cordata* Willd. (Caryophyllaceae)
   Local name: Jhom-Lakuti (Plain tribes)
   Folk use: Whole plant in the form of paste is prescribed to children to apply on forehead in high fever to stop vomiting.
   Biological activity: The plant part possesses anti-inflammatory activity.

31. *Eclipta prostrata* (L.) L. (Asteraceae)
   Local name: Keheraj (Plain tribes)
   Folk use: Juice of either leaves or whole plant is given orally to children in diarrhoea and dysentery.
   Biological activity: The plant possesses antiviral and hepatoprotective activities.

32. *Emblica officinalis* Gaertn. (Euphorbiaceae)
   Local name: Amloki (Plain tribes)
   Folk use: Decoction of fruit is taken in gastric problems and also in dysentery.
   Biological activity: Fruit extract is antihyperchlorohydric.

33. *Ficus religiosa* L. (Moraceae)
   Local name: Ahot (Plain tribes)
   Folk use: Stem bark in the form of paste is applied locally in gonorrhoea.
   Biological activity: The plant part possesses antiviral activity.
34. **Hibiscus rosa-sinensis** L. (Malvaceae)
   Local name: *Ronga-Joba* (Plain tribes)
   Folk use: Leaves in the form of paste is applied on forehead as cooling in headache
   Biological activities: Leaf extract is anti-inflammatory activity.

35. **Houttuynia cordata** Thumb. (Piperaceae)
   Local name: *Mojo- Khamao* (Plain tribes)
   Folk use: Root juice is taken orally in loose motion, vomiting and also in cholera.
   Biological activity: The plant part possesses anti-microbial activity.

36. **Hyptis suaveolens** (L.) Poit. (Lamiaceae)
   Local name: *Tockma* (Plain tribes)
   Folk use: Seed powder is sprayed locally in boils.
   Biological activity: The plant part possesses anti-inflammatory activity.

37. **Impatiens balsamina** L. (Balsaminaceae)
   Local name: *Kunti* (Plain Tribes).
   Folk use: Leaves in the form of paste is applied on forehead in fever.
   Biological activity: The plant part possesses antibiotic activity.

38. **Lantana camara** L. (Verbenaceae)
   Local name: *Ghoo- Phool* (Plain tribes)
   Folk use: Decoction of leaves is taken orally in tetanus.
   Biological activity: Leaf extract is antimicrobial.

39. **Leucas aspera** (Wild.) Link.=*L. plukentii* (Roth) Spreng. (Lamiaceae)
   Local name: *Darun* (Plain tribes)
   Folk use: Decoction of leaves along with goat milk is taken orally in piles.
   Biological activity: The plant part possesses analgesic and anti-inflammatory activities.

40. **Litsea cubeba** Pers. (Lauraceae)
   Local name: *Tin-Morcha* (Hill tribes), *Mejankri* (Plain tribes)
   Folk use: Decoction of fruit is given orally in colic and heart diseases. Paste of stem bark is applied in scabies and eczema.
   Biological activity: Citral contained in the plant parts possesses antimicrobial property apart from its effectiveness in coronary heart diseases.

41. **Mikania micrantha** H. B. & k. (Asteraceae)
   Local name: *Ripuji-Lota* (Plain tribes)
   Folk use: Leaves in the form of paste is applied to stop bleeding from cuts.
   Biological activity: Leaf extract possesses antiulcer activity.

42. **Mimosa pudica** L. (Mimosaceae)
   Local name: *Lajuki-Lota* (Plain tribes)
   Folk use: Root juice is applied locally in skin diseases like boils and scabies.
   Biological activity: Whole plant possesses antiviral activities.

43. **Moringa oleifera** Lam. (Moringaceae)
   Local name: *Sajina* (Plain tribes)
   Folk use: Root in the form of paste is applied in toothache and also to get relief of poisonous effect of snakebite.
   Biological activity: The plant part possesses antiviral and antibacterial activities.

44. **Musa paradisiaca** L.= *M. sapientum* L. var. *paradisica*. (Musaceae)
   Local name: *Bhim-Kol* (Plain tribes)
   Folk use: Ash extract of leaf sheath and fruit pulp is taken orally in acidity and flatulence.
   Biological activity: The extract possesses antiulcer activity.

45. **Nyctanthes arbor-tristis** L. (Oleaceae)
   Local name: *Sawali-Phul* (Plain tribes)
   Folk use: Leaves in the form of paste is applied on forehead in fever.
   Biological activity: The plant part possesses hypothermic activity.

46. **Ocimum gratissimum** L. (Lamiaceae)
   Local name: *Ram-Tulsi* (Plain tribes)
   Folk use: Leaf juice is taken orally in cough.
   Biological activity: Essential oil present in the plant parts possesses antibacterial activity.

47. **Ocimum tenuiflorum** L.=*O. sanctum* L. (Lamiaceae)
   Local name: *Tulsi* (Plain tribes)
   Folk use: Infusion of tender leaves is taken orally in stomach pain.
   Biological activity: Leaf extract possesses antiulcer activity.

48. **Oroxylum indicum** (L.) Vent. (Bignoniceae)
   Local name: *Bhat-Ghila* (Plain tribes)
   Folk use: Infusion of stem bark is taken orally in diarrhoea and dysentery.
   Biological activity: Extract of the plant part possesses antibacterial activity.

49. **Oxalis corniculata** L. (Oxalidaceae)
   Local name: *Tengesi* (Plain tribes)
   Folk use: Infusion of aerial parts is used to wash eye in eye problems.
Biological activity: Extract of the plant part is antibacterial.

50. **Paederia foetida** L. (Rubiaceae)
   Local name: Bhedai-Lota (Plain tribes)
   Folk use: Decoction of leaves is taken orally in gastralgia and also in postnatal pain and bleeding.
   Biological activity: Leaf extract possesses antispasmodial and antitussive activities.

51. **Piper betle** L. (Piperaceae)
   Local name: Pan (Plain tribes)
   Folk use: Leaves in the form of paste is applied locally in piles.
   Biological activity: The plant part possesses anti-inflammatory activity.

52. **Plumbago rosea** L. (Plumbaginaceae)
   Local name: Agyachita (Plain tribes)
   Folk use: Root is worn as garland to expel embryo.
   Biological activity: The plant part possesses anti-inflammation and abortifacient activities.

53. **Plumbago zeylanica** L. (Plumbaginaceae)
   Local name: Agyachita (Plain tribes).
   Folk use: Root powder is taken by women to induce sterilization.
   Biological activity: The plant part possesses anti-inflammation and abortifacient activities.

54. **Portulaca oleracea** L. (Portulacaceae)
   Local name: Malbhug-Khutura (Plain tribes)
   Folk use: Tender shoots and leaves are cooked and eaten in stomach problems.
   Biological activity: Extract of the plant part possesses antibacterial activity.

55. **Psidium guajava** L. (Myrtaceae)
   Local name: Madhuri-Am (Plain tribes)
   Folk use: Juice of tender twig is taken in blood dysentery.
   Biological activity: The plant part possesses antiviral activity.

56. **Ricinus communis** L. (Euphorbiaceae)
   Local name: Ara-Gash (Plain tribes)
   Folk use: Paste of leaves is applied as poultice in boil.
   Biological activity: Leaf extract possesses antibacterial activity.

57. **Sida acuta** Burm. f. (Malvaceae)
   Local name: Son-Borial (Plain tribes)
   Folk use: Juice of leaves is applied as cooling in cuts and wounds.
   Biological activity: The plant part possesses anti-inflammatory activity.

58. **Solanum nigrum** L. (Solanaceae)
   Local name: Lat-Kachu (Plain tribes)
   Folk use: Fruit juice is taken in liver problems.
   Biological activity: The plant part possesses hepatoprotective activity.

59. **Syzygium cumini** (L.) Skeels (Myrtaceae)
   Local name: Kala-Jamu (Plain tribes)
   Folk use: Juice of leaves and stem bark is taken orally in diabetes.
   Biological activity: The plant parts possess hypoglycaemic activity.

60. **Toddalia asiatica** (L.) Lam. (Rutaceae)
   Local name: Kanj (Plain tribes)
   Folk use: Decoction of root is given orally in malaria and other periodic fever.
   Biological activity: The plant part possesses anti-spasmodial activity.

61. **Tinospora sinensis** (Lour.) Merr. (Menispermaceae)
   Local name: Dau-Tholik (Hill tribes)
   Folk use: Juice of leaves and stem bark is taken orally in gonorrhoea.
   Biological activity: Extract of the plant parts possesses antiviral activity.

62. **Verbena officinalis** L. (Verbenaceae)
   Local name: Not Known
   Folk use: Entire plant in the form of paste is applied as plaster in burns.
   Biological activity: The plant part possesses anti-inflammatory activity.

63. **Vitex negundo** L. (Verbenaceae)
   Local name: Pachotia (Plain tribes)
   Folk use: Infusion of leaves is taken in jaundice.
   Biological activity: The extract of the plant part possesses antimicrobial activity.

64. **Zanthoxylum hamiltonii** Wall ex Dc. (Rutaceae)
   Local name: Tez-Moi (Plain tribes)
   Folk use: The stem on removing the bark is used to brush teeth in toothache and to stop bleeding from gums.
   Biological activity: The plant part possesses analgesic activity.

65. **Zingiber purpureum** Rosc. (Zingiberaceae)
   Local name: Borahu (Plain tribes)
   Folk use: Juice of rhizome is taken orally in paralysis.
   Biological activity: The rhizome is muscle relaxant and its essential oil possesses antimicrobial activity.
Discussion
The above results deal with positive correlation between reported ethno botanical uses of plant species from different parts of Assam and the reported biological activities of plant parts. The present study not only revealed the authenticity of traditional knowledge of the ethnici people of Assam on utilitarian aspects of these plant species but also indicated the possibility of utilizing them for greater economic use.

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