



# TRADITIONAL HEALING METHODS FOR BONE FRACTURE PRACTICED BY THE GARO TRIBE OF MEGHALAYA

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## Abstract

An ethno-medicinal study was conducted in West Garo Hills, Meghalaya, India during 2016-2018 to assess the traditional method of treatment for bone fracture by the traditional health practioners (THPs) of Garo tribe. Among various THPs, four most popular and accessible THPs were identified and interviewed using pre-tested interview schedule. Information like vernacular names, common names, scientific names, family, habit, habitat, plant parts used and detailed procedure for preparation of the medicine were recorded. Fourteen plant species belonging to thirteen different families were found to be extensively used for healing bone fracture. Out of the fourteen medicinal plants, four herbs, four shrubs, three trees, two climbers and one rhizomatous plant were used. *Cissus quadrangularis* and *Cissus triangularis* belonging to family Vitaceae received highest representation among all the plants used. These plants were used by all the THPs without any exception. Among the plant parts used, the leaves were the most commonly used plant part for preparation of the herbal medicine, followed by bark, stem, rhizome and in some cases the whole plant. The administration of these herbal medicines was mostly done orally in the form of juice/decoction. Wherever required, paste was applied locally. These medicinal plants were mostly collected from nearby forests, local markets and kitchen gardens. The transfer of these treasured traditional knowledge from one generation to another was done orally within the same family, community and seldom to interested outsiders. This paper presents the detailed mode of preparation and treatment procedure for bone fracture followed by the Garo THPs practicing in the West Garo Hills of Meghalaya.

**Key words:** Ethno-medicine, Bone fracture, Traditional medicine, Garo tribe.

## Introduction

Plants have been used in traditional medicine for several years. Documenting the indigenous knowledge is important for the conservation and utilization of available biological resources. Bone fracture or dislocations can occur at any time to anybody, during a fall, or an accident, and at times due to osteoporosis and bone tumor. Generally, the bone being a living tissue, constantly builds and hence rejoins and nourishes naturally. Bone healing using plants and their extracts with or without splints is widely practiced in traditional medicine. Healing bone fractures involves various steps. Bone setting involves pulling and adjusting the bones gently, back to their original position which are expertly done by the traditional health practioner himself. Thereafter, a concoction of herbal medicine in the form of pastes are applied locally to rejoin the bones. A decoction or juice of various plant parts are also taken

orally as painkillers. The use of herbal medicine is known to reduce the time of healing into half as compared to the use of allopathic medicine and surgeries as the traditional method of healing and many herbal preparations are known to hasten bone healing. One of the many benefits of herbal medicine for bone fracture or dislocation is its external and internal use of herbal medicines in various forms, which shows astounding results in decreasing pain, healing wounds and joining bones. However, these indigenous and traditional methods of healing is not well documented for future reference and use. Therefore, a survey was conducted to study and document the ethnomedicinal practices being practiced by the traditional health practioners (THPs) of Garo tribe in healing bone fracture.

## Materials and methods

The study was carried out in Rongram Rural Development Block of West Garo Hills district,

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Meghalaya. Rongram lies 25° 35' 0" North, 90° 15' 0" East and covers an area of 622 sq. km (Census 2011). Overall climatic condition prevailing in this block is tropical and sub-tropical. It embraces evergreen, semi- evergreen and deciduous forest also bamboo thickets and grassland<sup>1</sup>.

In Rongram Block, THPs treat a variety of ailments, from cough and cold to heart diseases to bone fractures. Access to health care is often a problem in remote villages of the Block due to limited government healthcare facilities. The people are largely dependent on the indigenous health care system. Local herbs and other plant resources found in that area are the principal source of medicine, and are prescribed by THPs /Ojha as medicines. This work concentrates on ethno medicinal plants and herbs commonly used by the Garo THPs of the area for healing bone fracture.

Selection of respondents was made using snowball sampling technique wherein, a chain- referral sampling technique was employed. More than fifty THPs were interviewed, of which four THPs were specialized in treating bone fracture traditionally, using plants as the main component. Initially several rapport-building visits was conducted in the study area. During these visits, discussions with local leaders, extension workers and other key informants was carried out. Community-wise meetings were conducted introducing research activity and its purpose, prompting selection of respondents from different villages within Rongram Block. Identification of ethnomedicinal plants being used by the Garo tribe was accomplished by free listing and personal interview with the Garo THPs. Identification of collected ethnomedicinal plants was done by comparing with related published literature on floras of the region *viz.*, Ethnobotany of Meghalaya: Medicinal plants of Khasi and Garo tribe<sup>2</sup>, The medicinal plants of North East India<sup>3</sup>, Tribal Knowledge on wild edible plants of Meghalaya, North-East<sup>4</sup>, Plants that heal, Vol- 2<sup>5</sup>, etc. Wherever required the officials of the Forest Department, Garo Hills Autonomous District Council, Tura and Forest and Environment Department, Tura, was consulted for proper identification and confirmation of the collected specimens. Vernacular names, scientific name, plant parts used, mode of usage, etc. was recorded. Data on mode of preparation and usage of various ethnomedicinal formulations was collected from the THPs using pre-tested interview schedules. The information thus gathered is tabulated and presented separately against each THP to give due recognition to their individual expertise.

### Results and Discussion

In this paper, the observations collected from the four

**Table 1:** Traditional healing method for bone fracture – Method-I (Source: Mr. Anal Sangma).

Sl. No.	Scientific Name	Family	Vernacular Name	Common Name	Habit	Habitat	Parts Used	References
1.	<i>Cissus quadrangularis</i>	Vitaceae	Char shira	Bonesetter	Fleshy climber	Low rainfall area	Stem	Dolui, <i>et al.</i> , (2004), Kirtikar and Basu (1999),
2.	<i>Cissus triangularis</i>	Vitaceae	Tin shira	Bonesetter	Fleshy climber	Low rainfall area	Stem	and Basu (1999),
3.	<i>Colocasia esculenta</i>	Araceae	Matchitagong	Colocasia/elephant ear	Herb	Lowlands, wetlands	Leaf	Mia <i>et al.</i> , (2009),
4.	<i>Styrax serrulatum</i>	Styracaceae	Bolnarang	Storax	Perennial small tree	Swampy, dry lands	Bark	Rahmatullah <i>et al.</i> , (2011)
5.	<i>Ornithogalum umbellatum</i>	Asparagaceae	Bethlehem	Star of Bethlehem	Flowering herb	Open grasslands, dry soils	Whole plant	

**Table 2:** Traditional healing method for bone fracture – Method-II (Source: Mr.Jengsin D. Shira).

Sl. No.	Scientific Name	Family	Vernacular Name	Common Name	Habit	Habitat	Parts Used	References
1.	<i>Crinum defixum</i>	Amaryllidaceae	Rajamuri/rajamole	Milk and wine lily	Large bulbous herb	Swamps, tropical and subtropical areas.	Leaf	Dolui, <i>et al.</i> (2004), Kirtikar and Basu (1999), Mia <i>et al.</i> , (2009), Rahmatullah <i>et al.</i> (2011)
2.	<i>Cissus quadrangularis</i>	Vitaceae	Char shira	Bonesetter	Fleshy climber	Low rainfall area	Stem	Dolui, <i>et al.</i> , (2004),
3.	<i>Cissus trinagularis</i>	Vitaceae	Tin shira	Bonesetter	Fleshy climber	Low rainfall area	Stem	Kirtikar and Basu (1999), Mia <i>et al.</i> , (2009), Rahmatullah <i>et al.</i> (2011)
4.	<i>Justicia gendarussa</i>	Acanthaceae	Dojagipe	Willow leaved justicia	Shrub	Primary and secondary forests, sides of streams	Leaf	Dolui, <i>et al.</i> , (2004)

THPs were presented separately to understand the similarities and dissimilarities of treatment methods being practiced by each THPs distinctly. Medicinal plants used by the THPs are presented in separate tables with their vernacular name, common name, scientific name, family, habit, habitat, plant parts used, and its method of preparation.

In the table 1, method of treatment practiced by Mr. Anal Sangma of Balongre village was presented. He used five plants viz. *Cissus quadrangularis*, *Cissus triangularis*, *Colocasia esculenta*, *Styrax serrulatum* and *Ornithogalum umbellatum* for the treatment of bone fracture. According to him, all the fresh plant parts were collected in equal proportions (5 grams each) and were grinded together in a mortar and pestle or a stone slab and made into a paste. The paste was placed in a clean cotton cloth which was about a few centimeters long, enough to cover the affected area and was bandaged locally for one day. The next day, the bandage was taken off and the affected area was washed with warm sea salt/ saline water. Then it was bandaged again using fresh paste and left for two days. After those two days, the washing process and bandaging process was repeated again and left for three days, and then the washing and bandaging was repeated again and left for four days. The treatment was completed in about ten to fifteen days, depending on the severity of the injury. The THP had to do the whole process himself. During the treatment, sour food was advised to be avoided for a speedy recovery.

In the table 2, the technique performed by Mr. Jengsin D. Shira of Lower Sangsangre village to heal bone fracture has been described. He used four plants viz. *Crinum defixum*, *Cissus quadrangularis*, *Cissus triangularis* and *Justicia gendarussa* for the herbal concoction. According to him, about ten leaves of *Crinum defixum* and *Justicia gendarussa* were collected and about four to five grams of the stems of *Cissus quadrangularis* and *Cissus triangularis* were also gathered. All of them were grinded together to create a fresh paste with a mortar and pestle or a stone slab and the paste was enveloped in a fresh and clean banana leaf and buried under a lit charcoal till it was cooked. The cooked contents were then tied locally using a clean cotton cloth for one day and changed every day for the next ten days or until it healed. It was to be observed that sour food was avoided during the treatment.

In the table 3, the remedial measures practiced by Mr. Jingdon A. Sangma of Wadanang village was presented. He used six plants viz. *Baliospermum montanum*, *Brachyglottis repanda*, *Cissus quadrangularis*, *Cissus triangularis*, *Justicia gendarussa* and *Zingerber officinale* for curing of bone fracture. All the fresh plant parts, the rhizome, stem and bark (six to seven grams) and leaves (seven leaves) were collected and washed and grinded together with a mortar and pestle or a stone slab and tied locally with the help of a clean cotton cloth or a crepe bandage for three days. On the fourth day, the affected area was washed with warm water and then the same process was repeated with a new and fresh paste for three days, repeated again for a total of fifteen days. For simple fractures the required time to heal in case of adults was ten to fifteen days and in the case of children, less than ten days was required. For a more effective healing, sour food and chilies were to be avoided during the treatment.

In the table 4, the mode of healing used by Mr. Late. Edmund M.

**Table 3:** Traditional healing method for bone fracture – Method-III (Source: Mr.Jingdon A. Sangma).

Sl. No.	Scientific Name	Family	Vernacular Name	Common Name	Habit	Habitat	Parts Used	References
1.	<i>Baliospermum montanum</i>	Euphorbiaceae	Boldokakki/laham	Wild castor	Shrub	Sub Himalayan tract to Khasi hills and also in central India.	Bark	Ignacimuthu <i>et al.</i> , (2006)
2.	<i>Brachyglottis repanda</i>	Asteraceae	Rangjora	Rangjora	Tall shrub	Tropical and sub-tropical areas	Leaf	Dolui, <i>et al.</i> (2004), Kirtikar and Basu (1999), Mia <i>et al.</i> (2009), Rahmatullah <i>et al.</i> (2011)
3.	<i>Cissus quadrangularis</i>	Vitaceae	Char shira	Bonesetter	Fleshy climber	Low rainfall area	Stem	
4.	<i>Cissus triangularis</i>	Vitaceae	Tin shira	Bonesetter	Fleshy climber	Low rainfall area	Stem	
5.	<i>Justicia gendarussa</i>	Acanthaceae	Dojagiye	Wild leaved justicia	Aromatic herb	Primary and secondary forests, sides of streams	Leaf	Dolui, <i>et al.</i> , (2004)
6.	<i>Zingerber officinale</i>	Zingiberaceae	Eching	Ginger	Rhizome	Tropical regions	Rhizome	

Sangma of Balading village was stated. He used six plants viz. *Adiantum lunulatum*, *Caerya arborea*, *Cissus quadrangularis*, *Cissus triangularis*, *Tinospora cordifolia* and *Terminalia arjuna* for the treatment of bone fracture. According to him, the vine of *Tinospora cordifolia* (one-foot-long) and stems of *Cissus quadrangularis* and *Cissus triangularis* (twenty grams each) were pulverized into a sticky paste using a mortar and pestle or stone slab, then placed in a clean cotton cloth and tied around the fractured area for 7 days. The fern of *Adiantum lunulatum* (seven ferns), without the root was washed thoroughly to remove all dirt and soil. A decoction of it was made by boiling in half a litre of water and then allowed to cool. A cup of this decoction was taken as an analgesic. The leaves of *Careya arborea* (seven) were crushed and boiled in half a litre of water to make a decoction and was used to sterilize the affected area, as well as to remove blood clots in the affected area. The bark of *Terminalia arjuna* (seven grams) was boiled in one litre of water and the decoction was taken two table spoons twice a day for a total of 7 days as an analgesic as well. Consumption of sour food was to be avoided during the treatment process. (It may be mentioned with profound grief that Mr. Edmund M. Sangma breathed his last after a few days of our interview).

In the present study, it was observed that out of 50 THPs interviewed only four THPs could offer treatment for bone fracture. It was also observed that a total of fourteen medicinal plants from thirteen families were used for the purpose. Interestingly they all used different plant species for the purpose except *Cissus quadrangularis* and *Cissus triangularis* which was used by all the THPs followed by *Justicia gendarussa* used by two THPs. Highest number of species representation was found to be both the *Cissus spp.* belonging to the family Vitaceae. This may be due to the fact that *Cissus quadrangularis* has a significant influence on healing bone fracture. The positive influence of this plant was reported by various scientists in the past<sup>6,7,8,9</sup>. It was reported that rich contents of calcium, phosphorus and phytoestrogenic property of *Cissus quadrangularis* attributed to increase in bone mass<sup>10</sup>. It was also opined that *Cissus quadrangularis* showed marked influence on the rate of fracture healing and significantly shortened the duration of bone healing due to the presence of vitamins and steroid that stimulated the cells of mesenchymal origin<sup>11</sup>. Beneficial effects of *Tinospora cordifolia* for healing bone fracture was also reported<sup>12,13,14,15</sup>. *Terminalia arjuna* was primarily reported that it not only helped to cure bone fractures but a decoction of its bark also acted as an analgesic<sup>16</sup>. *Adiantum lunulatum* was also found to have analgesic properties that helped to fully ease the pain of a fracture and made the healing process bearable<sup>17</sup>. The habit of the medicinal plant species documented, showed that the herbal medicines were obtained from herbs (four), shrubs (four), followed by tree (three), fleshy climbers (two) and rhizome (one). According to the tabulated data, the leaf (six) was most commonly used plant part for preparation of herbal medicine followed by the bark (three), the whole plant (two) and the stem (two) and the rhizome (one). These medicinal plants were either consumed orally in the form of juice or decoction and the pastes were applied topically. Most of these plants grew in the wild and a few were cultivated in the THP's homestead

Table 4: Traditional healing method for bone fracture – Method-IV (Source Late. Edmund M. Sangma).

Sl. No.	Scientific Name	Family	Vernacular Name	Common Name	Habit	Habitat	Parts Used	References
1.	<i>Adiantum lunulatum</i>	Pteridaceae	Dokongsibijak	Maidenhair fern	Fern	Rocky slopes, moist soil, humus rich wood	Whole plant	Pallavi, <i>et al.</i> , (2011), Pan <i>et al.</i> (2001)
2.	<i>Caerya arborea</i>	Lecythidaceae	Gimbil	Wild guava	Tree	Sub-tropical and tropical area	Leaf	Dolui, <i>et al.</i> (2004), Kirtikar and Basu (1999), Mia <i>et al.</i> , (2009), Rahmatullah <i>et al.</i> (2011)
3.	<i>Cissus quadrangularis</i>	Vitaceae	Char shira	Bonesetter	Fleshy climber	Low rainfall area	Stem	Upadhyay, <i>et al.</i> , (2012), Kirtikar and Basu (1999), Chakraborty and Bhattacharjee (2006)
4.	<i>Cissus triangularis</i>	Vitaceae	Tin shira	Bonesetter	Fleshy climber	Low rainfall area	Stem	Singh, (2017) and Gupta, <i>et al.</i> , (2018), Kirtikar and Basu (1999), Phondani, <i>et al.</i> , (2010), Patnaik, <i>et al.</i> , (2007)
5.	<i>Tinospora cordifolia</i>	Menispermaceae	Amtrurubudu	Heart leaved moonseed	Climbing shrub	Waste ground	Vine	
6.	<i>Terminalia arjuna</i>	Combretaceae	Arjun	Arjun	Tree	River banks, tropical areas	Bark	

garden. However, like most traditional practitioners, the Garo THPs also has not much knowledge of the strength of their remedies, dosing depends entirely on each practitioner<sup>18</sup>. This lack of standardization and precision in dosage is seen as one of the main disadvantage of traditional medicine<sup>19</sup>. In spite of these shortcomings, the demand for traditional method of healing is still gaining popularity among the Garo community. Even the urban population has a special fascination towards traditional medicines. But the ever-decreasing number of THPs is a matter of concern because the present generation is shying away from taking the THPs as a full-time profession and thus poses serious threat to the conservation of this vast knowledge of the community. Therefore, proper documentation of the knowledge and conservation of the medicinal plants deserve adequate attention from the scientific world in particular and the humanity in general.

### Conclusion

In conclusion, the study indicates that THPs have basic knowledge about the traditional method of healing bone fracture. This goes to show that THPs play a very important role in primary health care system. These herbal plants are considered today, as an icon of safety in contrast to the synthetic drugs, that are regarded as unsafe to human beings and the environment as well. Therefore, it is our principal liability to protect and conserve not only the plant species but the indigenous knowledge as well for future use.

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