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### RESEARCH ARTICLE

#### STUDY ON DYE YIELDING PLANTS OF THE KARBIS OF NAGAON, ASSAM.

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#### Abstract

Nagaon District, Assam near Kaziranga National Park is rich in biodiversity and contributes a lot to the total biodiversity of the state. The area is inhabited by various ethnic groups having a rich knowledge of natural products. A survey was conducted during 2014-2015 within the Karbi community on the use of natural dye yielding plants. A total of 25 plants were enumerated during the study, along with their botanical names, families, plant parts used and the colours produced.

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#### Introduction:-

From the time immemorial, human love cloths of attractive colours and shades (Ganesh, 2008) to add liveliness to the dresses (Kar & Borthakur, 2008). Natural dyes are those colourants that are obtained from animal and vegetable matter without chemical processing ( Kar & Borthakur, 2008 and Upadhyaya & Choudhary, 2012 ). These colours may derive from root, leaf, bark, trunk, fruit and flowers of plants and from animals also. Natural dyes were not only used to impart colour to an infinite variety of materials such as textiles, paper, wood etc. but also are widely used in cosmetic, food and pharmaceutical industry (Chengaiyah et.al, 2010). The Karbis, one of the major tribes of Nagaon District, Assam, India, practices traditional dyeing of clothes using plants (Teron and Borthakur, 2012). Due to lack of written record and habitat destruction in one hand while easy availability and easy use of the low-cost synthetic dyes, at present many of the dye yielding plants, were neglected and are under constant pressure and may get vanished in the near future. Considering the facts, a detailed survey of the dye yielding plants was conducted to record the status of these plants and the methods of preparation of the dye in the area to share the information for increasing awareness as a measure for their conservation.

#### Materials and Methods:-

An extensive field survey was conducted guided by the locals during the year 2014-15 at Nagao district, Assam, India. The locally identified dye yielding plants were collected and herbarium voucher specimen was prepared following the method of Jain SK and Rao RR (1977), which were later identified following the Flora of British India (Hooker JD, 1875-97). Information on dye yielding plants was recorded through semi-structured interview cum individual personal consent (IPC) of the volunteer respondents who had the knowledge of the art. The methods of dye preparation were also recorded through discussions.

#### Study Area:-

The study area Nagao, which is a new name (from Nowgong, meaning New Settlement by Momai Tamuli Barbarua) is the fifth largest city next to Guwahati is one of the 27 districts of the state of Assam (78,438 sq km) that has a population of 2,823,768 with an area of 3973 sq km (Census, 2011). On the north, Nagaon is bounded by Sonitpur district & the Brahmaputra, towards its south lies West Karbi Anglong and North Cachar Hills, towards its east lies

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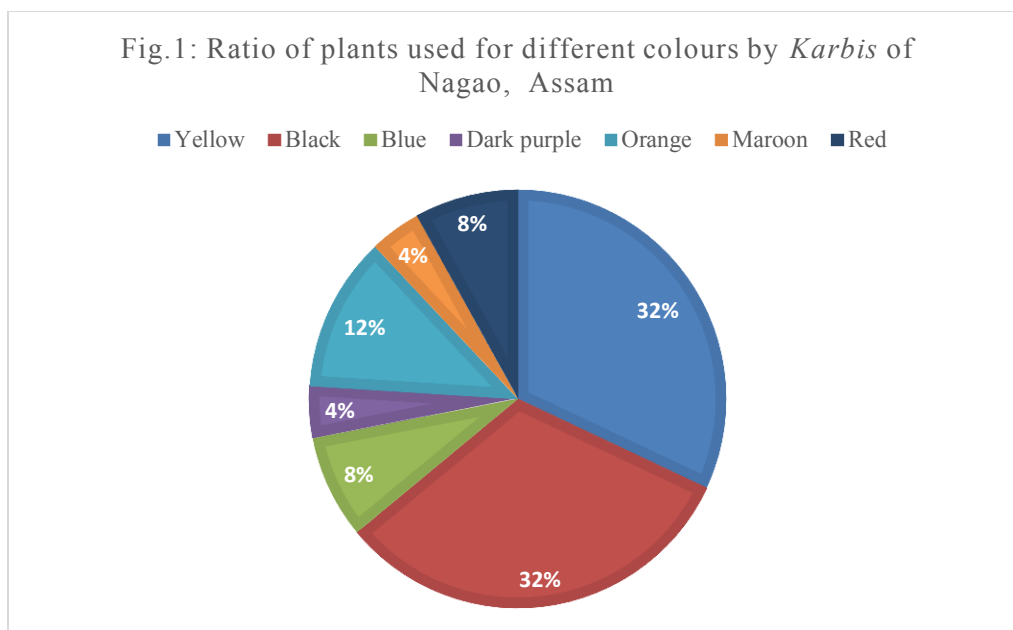
the districts of East Karbi Anglong and Golaghat. The area of the district spans 3993 Sq. Km. making it one of the largest districts of Assam. The district extends between 25° 45' to 26° 45' North Latitudes. Its highlands include the Hatimura Parbat with an elevation of 186.5 m, the Barkandali with an altitude of 853 m and the Kamakhya Parbat with an altitude of 244 m. The average altitude of the district is 60.6 m. Its major rivers include the Brahmaputra, Kalong, Sonai, Nanoi, Jamuna, Kopili and the Barpani. There are several beels, marshy lands and swamps; these are in reality the old abandoned channels of the Kalong and the Kopili rivers. These are the Marikalong, Potakalong, Haribhanga, Jongalbalahu, Samoguri beel, Urigadang and the Nawbhanga. These beels are major unused resources of the district. There are about two hundred numerous marshy lands here. Together with Morigaon district, it has the shape of a broken dish. The north and the south are uplands. Geomorphologically Marigaon and Nagaon together constitute a Geomorphological area. The general slope of the district is towards the west. The eastern, north eastern and the south eastern parts are hilly terrains. The climate is in general Monsoon type. Rainfall increases towards the east and the west of Assam from this district. The climate is of an extreme type compared to other districts of Assam. The pattern of rainfall is such that the south is usually dry and the north is relatively more rainy. Rainfall from south to north increases from 1000 mm per annum to 2000 mm per annum. The area around Lanka is a semi desert. The cold season is from December to February. Floods create havoc usually from June to October. The monsoon lasts from April to May. The post monsoon season lasts from October to November. The average rainfall is about 1750 mm. Today the district has a vegetation cover of only 12%. The town has an average altitude of 61m from mean sea level. The town has an average rainfall of 1760 mm per annum. The temperature in winter varies from a maximum of 24.8 °C to a minimum of 11.2 °C, in summer (32.9 °C to of 25.5 °C). The annual average maximum temperature is 30.4 °C and the minimum is 19.8 °C. The major river is the Kalong which divides the town into two halves - Haibargaon and Nagaon. Haibargaon slopes down towards the west and then to the south west towards the Sonai. Nagaon slopes down first towards the south east and then southwards to the beels and then towards Kalong (<http://nagaon.nic.in/geog.html>). Nagao is the home of various ethnic groups like Bengali Muslim, Assamese muslim, Assamese Brahmins, Kalita, Bengali Hindus, Tiwa (Lalung), Tea tribes and Koch Rajbongshis. Assamese is the lingua franca and the communicating language in the district (<http://nagaon.nic.in/>). Ethnically the Karbis are Mongoloids and speak a Tibeto-Burmese language (Bhattacharjee, 1986). Though their habitations are mainly concentrated in the Karbi Anglong and North Cachar Hills Districts of Assam, they are also found in Nagaon where the cultural preponderance of the neighboring plains influence the culture of the Karbis (Bhattacharjee, 1986). Karbis still practice the traditions of dyeing textiles, crafts and skin with colors of different shades, extracted from plants, animals (particularly insects) and minerals (Teron and Borthakur,2012).

### Results and Discussion:-

A total of 25 dye yielding species belonging to 17 Angiosperm families has been recorded in the present work which is listed below (Table 1). Maximum species (3 each) were found in the families Papilionaceae and Euphorbiaceae. Two species each belongs to the four families viz. (Caesalpiniaceae, Rubiaceae Myrtaceae and Verbenaceae). while one species each in the remaining eleven families. The finding suggested that natural dyes are contributed from the diverse source of plants. Out of the 25 species, seven different colours were produced, which were not related to the families and were species dependent, suggesting the equal importance of all the species and the impossibility of replacing one species by another of the same family. Hence all the dye yielding plants need to be protected and cultivated from the conservation view point.

**Table 1:-** List of dye yielding plants, families, colour produced and parts used by Karbis of Nagao, Assam

| Sl. No | Name of the Plants/Voucher No.  | Family         | Local Names  | Plant parts used          | Colour impart |
|--------|---|----------------|--------------|---------------------------|---------------|
| 1.     | <i>Aegle marmelos</i> (L.) Correa<br>RGUMSVS14/2015                     | Rutaceae       | Thepli       | Tender fruit<br>(crushed) | Yellow        |
| 2.     | <i>Atrocarpus heterophyllus</i> Lam.<br>RGUMSVS20/2015                  | Moraceae       | Jungthang    | Wood                      | Yellow        |
| 3.     | <i>Baccaurea ramiflora</i> Lour.<br>RGUMSVS23/2015                      | Euphorbiaceae  | Tampijuk     | Tender Leaf               | Black         |
| 4.     | <i>Bauhinia purpurea</i> L.<br>RGUMSVS15/2015                           | Caesalpinaceae | Kanchan      | Bark (stem)               | Yellow        |
| 5.     | <i>Basella alba</i> L. var <i>rubra</i> (L.)<br>Stewart/ RGUMSVS13/2015 | Basellaceae    | Purai        | Ripe Fruit                | Dark purple   |
| 6.     | <i>Bixa orellana</i> L.<br>RGUMSVS01/2015                               | Bixaceae       | Senduri      | Dry seed<br>powder        | Orange        |
| 7.     | <i>Butea monosperma</i> (Lam.) Taub.<br>RGUMSVS12/2015                  | Papilionaceae  | Polash       | Petal                     | Yellow        |
| 8.     | <i>Clitoria ternatea</i> Lin.<br>RGUMSVS17/2015                         | Papilionaceae  | Aporajita    | Petal                     | Blue          |
| 9.     | <i>Curcuma longa</i> L.<br>RGUMSVS10/2015                               | Zingiberaceae  | Tharmid      | Rhizome                   | Yellow        |
| 10.    | <i>Delonix regia</i> (Hook.) Raf.<br>RGUMSVS11/2015                     | Caesalpinaceae | Radhasura    | Gum                       | Yellow        |
| 11.    | <i>Eclipta prostrata</i> (L.) L.<br>RGUMSVS02/2015                      | Asteraceae     | Kehraj       | Whole plant               | Black         |
| 12.    | <i>Indigofera tinctoria</i> L.<br>RGUMSVS24/2015                        | Papilionaceae  | Sibu         | Leaf & Twig               | Blue          |
| 13.    | <i>Phyllanthus emblica</i> L.<br>RGUMSVS03/2015                         | Euphorbiaceae  | Thelu        | Fruit                     | Black         |
| 14.    | <i>Garcinia morella</i> (Gaertn.) Desr.<br>RGUMSVS16/2015               | Clusiaceae     | Kuji-thekera | Ripe fruit                | Yellow        |
| 15.    | <i>Lawsonia inermis</i> L.<br>RGUMSVS05/2015                            | Lythraceae     | Jituka       | Leaf                      | Maroon        |
| 16.    | <i>Mallotus philippensis</i> (Lam.)<br>Mull.Arg. RGUMSVS06/2015         | Euphorbiaceae  | Jarul        | Ripe fruit<br>(crushed)   | Red           |
| 17.    | <i>Morinda angustifolia</i> Roxb.<br>RGUMSVS22/2015                     | Rubiaceae      | Tarlong      | Root                      | Yellow        |
| 18.    | <i>Nyctanthes arbor-tristis</i> L.<br>RGUMSVS19/2015                    | Verbenaceae    | Theching     | Corolla tube              | Orange        |
| 19.    | <i>Piper betel</i> L.<br>RGUMSVS07/2015                                 | Piperaceae     | Bikron       | Leaf                      | Black         |
| 20.    | <i>Psidium guajava</i> L.<br>RGUMSVS21/2015                             | Myrtaceae      | Menduram     | Bark (Stem)               | Black         |
| 21.    | <i>Punica granatum</i> L.<br>RGUMSVS18/2015                             | Punicaceae     | Dalim        | Fruit & Seed              | Black         |
| 22.    | <i>Rubia cordifolia</i> L.<br>RGUMSVS25/2015                            | Rubiaceae      | Majathi      | Root                      | Red           |
| 23.    | <i>Syzygium cuminii</i> (L.) Skeels.<br>RGUMSVS08/2015                  | Myrtaceae      | Jangmi       | Bark (Stem)               | Black         |
| 24.    | <i>Tectona grandis</i> L.f.<br>RGUMSVS09/2015                           | Verbenaceae    | Lotungpo     | Leaf                      | Orange        |
| 25.    | <i>Terminalia cebula</i> Retz.<br>RGUMSVS04/2015                        | Combretaceae   | Hilika       | Fruit                     | Black         |



### Conclusion:-

It is clear from the present work that the study area has a good amount of dye yielding plants. But the use of natural dyes for textile dyeing purposes, decreased to a large extent after the discovery of synthetic dyes (Goodarzian, 2010). Looking at the growth of natural products the world over, there is tremendous growth potential and it is lagging far behind its potential (Das and Mondal, 2012). Though the natural dyes have few disadvantages over synthetic dyes but to-days environmental point of view is that the traditional natural dyes might be an alternative pathway to developed eco-friendly products.

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