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***Research Article***

# THREATENED PLANTS OF MALEGAON AND BAGLAN FOREST RANGES IN NASIK DISTRICT, MAHARASHTRA, INDIA

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**ABSTRACT**
The research paper deals with the 79 threatened flowering plants of Malegaon and Baglan forest ranges in Nasik District of Maharashtra. Out of the 79 species there are 9 Critically Endangered, 19 Endangered, 28 Vulnerable, Lower Risk 21, (including 16 Near Threatened and Least Concerned 4) and Data Deficient 3. The threat assessment was carried out through the field Data Collection in Taxon Data Sheets using standard procedure of IUCN Red List Categories and criteria. Taxon Data Sheets are working documents that provided information which was used to assess the degree of threats and recommended for conservation action. The threat status of flowering plants in the study area has not been carried out so far. For conservation point of view the present study is very useful.

***Keywords*:** *Threat Status, Threat Categories, Conservation Recommendations, Malegaon and Baglan, Nasik District*

## INTRODUCTION

Biodiversity is destroyed rapidly throughout the world. The loss of habitat, climate change, genetic problems, hunting for food, medicines inter specific competition, invasion of exotic species, over exploitation is the major causes of threats to the loss of species. Thus, reliable and well documented information on rare, threatened and endangered species is necessary to protect our plant wealth. The International Union for Conservation of Nature and Natural Resources (IUCN) has provided guidelines for this type of work and enlisted the endangered species of plants and animals in the Red Data Book. IUCN (1993) and Mac and Stuart (1994) classified such species into categories, as Extinct (EX), Extinct in the wild (EW), Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Lower Risk (LR): i) conservation dependent (cd), ii) near threatened (r.t) and iii) least concerned (Ic) taxa. The Botanical Survey of India has completed survey of plant resources only in three fourth of the country. Conservation of Rare, Endangered and Threatened (RET) plants is a big task. Jain and Sastry (1987) reported more than hundred RET species.

Red list data book contains 622 vascular plant species (VPS). These data still need to be improved. The present study is an attempt towards this task.

The Higher plant species threatened in India was reported at 246 in 2008. Threatened species are the number species classified by IUCN as endangered, vulnerable, rare species, least concerned, data deficient etc.

Indian species have been studied by Jain & Sastry (1980, 1982) and Nayar & Sastry (1987).

The Western Ghats comprises the mountain range that runs along the west coast India from Vidhya-Satpuda ranges in North to Southward. There are 4000 higher plants out which 1500 endemic and 103 species comes under threat categories.

There are no reports on threatened species of Baglan & Malegaon Forest area. Lakshminarasimhan & Sharma (1991) though published the Flora of Nasik but they too have not even explored this region. Some of the localities like Mangi-Tungi and Saler-Mulher are rich in biodiversity. This is first attempt to study threatened species of Baglan and Malegaon Forest area.

### *The Study Area*

Malegaon forests situated in the north-east, the largest sub-division in the district, is bounded on the north by the Pimpalner and Dhulia, and on the east by the Dhulia and Chalisgaon subdivisions of Khandesh; on

the south-east and south by Nandgaon and Chandwad; and on the west by Kalvan and Baglan. Its area is about 775 square miles.

Baglan forests are one of the northern sub-divisions, is bounded on the north by the Pimpalner sub-division of Khandesh; on the east by Malegaon; on the south by Kalvan; and on the west by the Gujarat State. Its area is about 619 square miles. The forest area under the control of the Forest Department consists of the reserved forests covering 2,920.07 km2 (1,127.44 sq. miles), the protected forests covering 245.45 km2 94.77 sq. miles) and unclassified forests, 173.32 km2 (66.92 sq. miles). The forests in the district are one of the important forests of the State. Western Ghats has been considered one of the global hotspot and study area is an outside of this region.

## MATERIALS AND METHODS

1. The study is based on field work following the standard procedures published (Jain & Rao, 1977). Species have been identified by consulting Floras (Flora of Presidency of Bombay, Cooke, 1958 edition, Flora of Maharashtra, 1996, 2000, & 2001 edition). Herbarium specimens are deposited in the Department of Botany, Z. B. Patil College Dhule.
2. Threat assessment has been carried out by IUCN Red List Categories of Threat from the information gathered during field work filled in the Taxon Data Sheets.
3. Flowering species (79) selected have been assigned the status of threat categories following the guidelines provided by IUCN (1993).

### *Synoptical Data*

Recent studies on Biodiversity and ecology of Baglan and Malegaon forest ranges in Nasik district has been extensively carried out by Jadhav (2011) recorded 843 species, spread over 465 genera and 111 families of flowering plants.

The present study critically analyzed his work. Jadhav (2011) also Recorded 117 Rare, 15 Endangered and 07 species as Vulnerable. We have carefully selected 79 species which seems to be under threat of extinction according to IUCN categories. The species are enlisted in table 1 and their numbers category wise is given in Table 2 and pie graph (Figure 1).

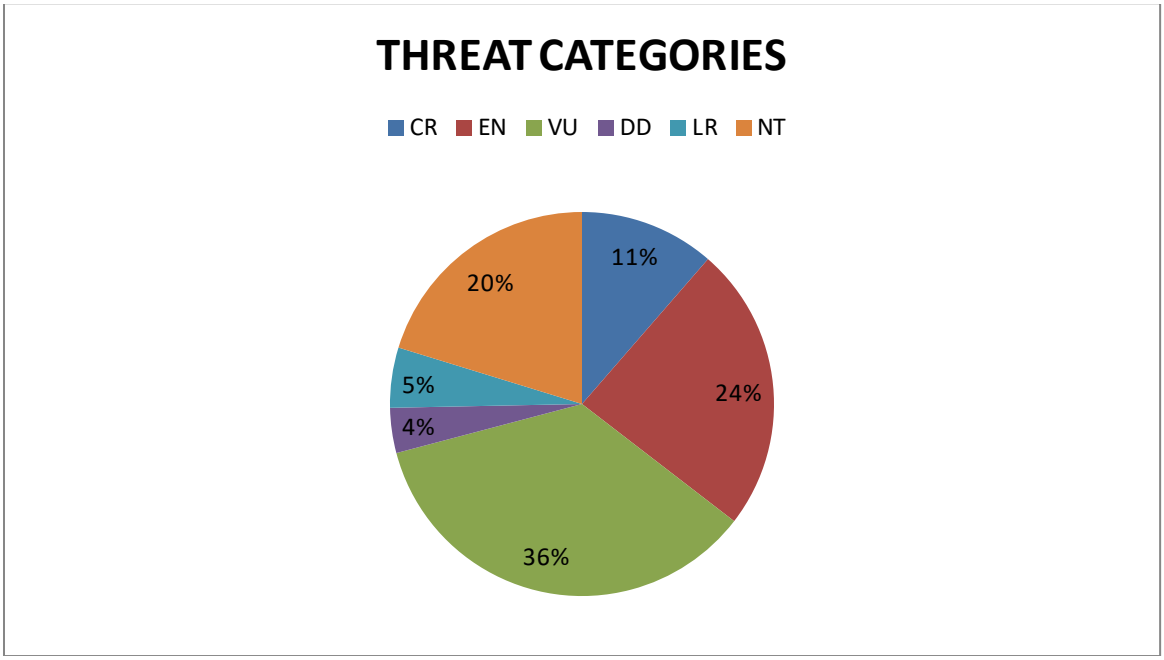


**Figure 1: Pie Diagram of IUCN Categories of Plants Assessed from the Forest of Malegaon and Baglan in Nasik District,** *CR- Critically Endangered, EN- Endangered, VU-Vulnerable, DD-Data Deficient, LR- Lower Risk, NT-Near Threatened*

**Table 1: List of Plants of Threat Categories from Malegaon and Baglan**

| Sr. No. | Botanical names | Threat Status | Criteria |
|---|---|---|---|
| 1 | *Abutilon indicum (l.) Sweet.* | NT | B2c&D2 |
| 2 | *Alangium salvifolium (l.f.) Wang.* | NT | A2 b |
| 3 | *Arisaema murrayi (grah.) Hook.* | VU | A2cdB1 |
| 4 | *Aristolochia bracteolata lam.* | LC | Not applicable |
| 5 | *Begonia crenata dryand* | EN | B2a&b iii |
| 6 | *Bryonia dioica jacq.* | EN | A2b & B3a |
| 7 | *Bulbophyllum fimbriatum (lindl.) Reichb.f.* | VU | A2cd &D1 |
| 8 | *Butea monosperma (lam) taub.var.lutea will.* | EN | A2cd |
| 9 | *Caesalpinia bonduc (l.) Roxb.* | DD | Not applicable |
| 10 | *Cajanus scarabaeoides (l.) Du-petit-thours.* | NT | B2c D1 |
| 11 | *Carexcariciana wahlenb* | DD | Not applicable |
| 12 | *Cassia mimosoides l.* | NT | B2cD1 |
| 13 | *Celastrus paniculatus willd.* | VU | A2bc |
| 14 | *Centella asiatica (l.) Urban* | VU | B2a &C2b |
| 15 | *Ceropegia bulbosa roxb.* | EN | A2cd |
| 16 | *Ceropegia oculata hook.* | EN | A2c & B1 |
| 17 | *Chlorophytum arundianaceum baker* | VU | A2cd,B1 |
| 18 | *Chlorophytum borivilianum sant.& fernand* | EN | A2cd |
| 19 | *Chloroxylon swietenia dc.* | EN | A2cd |
| 20 | *Cleome simplicifolia* | VU | B2cd |
| 21 | *Cochlospermum religiosum* | CR | A2cd |
| 22 | *Coix lacryma-jobi l.* | VU | A2cd |
| 23 | *Cordia gharaf (forssk.) Ehrenb. & asch.* | VU | A2cd |
| 24 | *Cryptocoryne retrospiralis (roxb.) Kunth* | VU | A2cd |
| 25 | *Curcuma amada roxb.* | NT | B2cd |
| 26 | *Cyclea peltata (lam.) Hk.f. & thoms.* | VU | A2cd |
| 27 | *Dalbergia volubilis roxb.* | EN | A2c,D1 |
| 28 | *Delonix alata (l.) Gamble* | EN | A2cd |
| 29 | *Diospyros buxifolia (bl.) Hiern* | EN | B2cd |
| 30 | *Dioscorea esculenta (lour.) Burkill* | LR (cd) | Not applicable |
| 31 | *Dioscorea pentaphylla l.varjacquemontii Prain & burkill* | VU | A2cd, B1 |
| 32 | *Dioscorea wallichii hk. F.* | VU | A2cd |
| 33 | *Dipcadi ursulae blatt.var urusulae* | EN | B2a,b |
| 34 | *Drimia indica (roxb.) Jessop* | VU | B1c2d |
| 35 | *Dyschoriste nagchana (nees) bennet* | NT | B2c,D2 |
| 36 | *Embelia ribes burm. F.* | DD | Not applicable |
| 37 | *Eriolaena stocksii hook. F.* | EN | A2cd |

| | | | |
|---|---|---|---|
| 38 | *Eulophia herbacea lindl.* | CR | A2c,B1 |
| 39 | *Eulophia nuda lindl.* | EN | A2c |
| 40 | *Eulophia ramentacea lindl. Ex wight.* | CR | A2c,B1 |
| 41 | *Fagonia schweinfurthii (hadidi) ex ghafoor* | VU | A2c |
| 42 | *Ficus tinctoria forst.* | VU | A2c,B1 |
| 43 | *Grewia superba l.* | VU | A2c |
| 44 | *Grewia villos willd.* | EN | A2cd |
| 45 | *Habenaria foliosa a.rich.var Gibsonii (hk.f.)Bennet* | EN | A2c,D |
| 46 | *Helicteris isora l.* | LC | Not applicable |
| 47 | *Holostema annulare (roxb.)K,schum.* | CR | A1cde |
| 48 | *Hitchenia caulina (grah.) Baker* | VU | A2cd |
| 49 | *Impatiens dalzellii hk. F.& thoms.* | VU | B2a,d2 |
| 50 | *Indoneesiella echioides (l.) Sreem.* | NT | B2c,D2 |
| 51 | *Iphigenia pallida baker* | EN | A2cd,B1 |
| 52 | *Kydia calycina roxb.* | VU | A2cd |
| 53 | *Leea robusta roxb.* | NT | B2d,D2 |
| 54 | *Leea nicotianaefolia roth ex r, & s.* | VU | B2c & C2a |
| 55 | *Macaranga peltata (roxb.) Muell.-arg.* | CR | A2cd |
| 56 | *Morinda pubescens sm.* | NT | B2c,D2 |
| 57 | *Mucuna monosperma dc ex wight.* | VU | A2cd |
| 58 | *Nervillia aragoana gaud.* | VU | A2cd |
| 59 | *Nervillia prainiana (kimg & prantl.)Sied* | NT | B2a,D2 |
| 60 | *Oroxylum indicum (l.) Vent.* | EN | A2cd |
| 61 | *Ottelia aismoides (l.) Pers* | VU | A2cd &B1 |
| 62 | *Phoenix acaulis roxb.ex buch.-ham.* | VU | A2cd, D1 |
| 63 | *Plumbago zeylanica l.* | CR | A2cd |
| 64 | *Pterospermum acerifolium (l.) Willd.* | CR | A2c ,B1 |
| 65 | *Pueraria tuberosa (roxb.exwilld.) Dc* | NT | A2d |
| 66 | *Salix tetrasperma roxb.* | NT | B2c, D1 |
| 67 | *Sauromatum venosum (ait.)Schutt.* | VU | A2cd,B1 |
| 68 | *Schrebera swietenioides roxb.* | CR | A2c , B1 |
| 69 | *Senecio edgeworthii hk f.* | VU | A2cd |
| 70 | *Spermadictyon suaveolens roxb.* | EN | A2c |
| 71 | *Spondias pinnata (l. F.) Kurz.* | VU | A2cd |
| 72 | *Stereospermum colais (buch.-ham.) Mabb.* | CR | A2cd |
| 73 | *Striga gesnerioides (willd) vatke* | NT | B2a, D2 |
| 74 | *Tacca leontopetaloides (l.) Ktze.* | VU | A2c, B1 |
| 75 | *Tragus roxburghii panigr.* | NT | B2cd |
| 76 | *Tephrosia senticosa (l.) Pers.* | NT | B2cd |
| 77 | *Terminalia cuneata roth* | NT | A2cd |
| 78 | *Uraria picta (jacq.) Desv.ex dc* | LC | Not applicable |
| 79 | *Wiesneria triandra (dalz.) Mich.* | NT | Not applicable |

## RESULTS AND DISCUSSION

Data collected during the field study are represented in Table 1 and Table 2. Information on 79 species found to be appropriate to include in the study are enlisted in Table 1 along with the threat categories and criteria used.

The various Threat categories of 79 plants are represented in table 2 showing that 9 species are Critically Endangered, 19 are Endangered, 28 Vulnerable, 3 Data deficient species, 16 not applicable because of insufficient data to arrive at any conclusion and 4 species are with Lower Risk which does not satisfy the criteria for any of the IUCN categories. Out of the 79 species 56 species are under the threat categories which is 71% of the total species studied.

29% species are under the Risk of some kind of threats. The various threats may be genetic problems in population distribution, hunting for medicinal purpose, loss of habitat because of fragmentation. The species under the threat categories needs further intensive studies like population, distribution etc. It is recommended that the threatened species may be followed cultivation practices as per the suggestions of IUCN.

Further Research on genetic studies, monitoring to determine the population information, habitat management, limiting factors monitoring and life history studies.

**Table 2: Threat Categories of 79 Flowering Plant Species from Forest of Malegaon and Baglan in Nasik District**

| Sr. No. | Category | No. of Species |
|---|---|---|
| 1 | Critically Endangered –CR | 09 |
| 2 | Endangered-EN | 19 |
| 3 | Vulnerable VU | 28 |
| 4 | Data Deficient-DD | 03 |
| 5 | Near Threatened-NT | 16 |
| 6 | Least Concern-LR | 04 |

### *Conclusion*

Present study (Figure 1) has revealed that in the study area there are 79 threatened flowering plant species under the threat categories. They have been critically analyzed following the IUCN (1993, 2000) guidelines. Out of the 79 plant species, 9 are critically endangered, 19 endangered, 28 vulnerable, 16 not evaluated because of in sufficient data, 3 data deficient and 4 lower risk species. 71% species are under severe threats and 21% are under the Lower Risk. The threat causes are mainly trade, overexploitation, habitat loss, habitat fragmentation, over grazing, soil erosion, climate changes, and loss of reproduction, low seed germination capacity and shifting cultivation, inter specific competition and genetic problems.

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