Enumeration of Flowering Plants of Senchal Wildlife Sanctuary, West Bengal, India

Ajay Ghosh and T. K. Paul¹

3/1, P.K. Roychowdhury 1st bye Lane, Howrah – 711103

¹Corresponding author: E-mail: tapaspsi@gmail.com

[Received 16.11.2019; Revised & accepted 24.12.2019; Published 31.12.2019]

Abstract

In the present communication 226 Angiosperm species have been recorded from the Senchal wildlife sanctuary in the Darjeeling district, West Bengal. Out of these, 19 species have been found to be medicinally important.

Key words: Flowering plants, Senchal wildlife sanctuary, Darjeeling.

INTRODUCTION

The Senchal Wildlife Sanctuary, located in Darjeeling district of West Bengal, India, covers an area of 38.6 sq km. The Sanctuary lies approximately 26°31' – 27°13' N latitude and 87°59' – 88°53' E longitude and spreading over an elevational gradient of 1500 – 2600 m. 'Senchal' means 'The Hill of Damp and Mist' and so the sanctuary was named as "Senchal Wildlife Sanctuary". It is one of the oldest wildlife sanctuaries of India and set up in 1915. The core area of the Sanctuary remains cold throughout the year. The day temperature varies from 5°C – 15°C. July and August are the monsoon months in the area. The core area of the sanctuary receives 2500 – 3000 mm of annual rainfall. This huge amount of water drains out through the fountains and slopes from the hilly part of the Sanctuary finally to Teesta River on the east part and to Balason river on the west. The soil is loose, immature and of Mountainous loamy type, somewhere mixed with sands on the upper part. Only in the Kurseong part the soil is of alluvial mixture that favors the growth of tree species

VEGETATION

The vegetation of the Sanctuary may be classified as Lower hill forests (1400 – 1600 m), Middle hill forests (1600 – 2000 m) and Upper hill forests (2000 – 2600 m). The vegetation of the lower hill forests is remarkable due to density and diversity of species. The elements represented in this zone include *Arundinaria hookeriana*, *Barleria cristata*, *Buddleja asiatica*, *Pouzolzia viminea*, and *Engelhardtia spicata*. Some members of Zingiberaceae like *Coutleya spicata*, *Globba racemeosa*, *Hedychium gracile* have also been found to grow. The dominant taxa in the middle hill forests include *Acer thomsonii*, *Rhus* spp., *Dichroa febrifuga*, and *Oxyspora paniculata*. The undergrowth species in this area are *Ranunculus diffusus*, *Viola serpens*, *Stellaria pattens*, *Primula* spp., and *Clerodendrum* sp. The members of Ericaceae (*Rhododendron arboreum*, *R. grande*) and members of Magnoliaceae (*Magnolia dalsopa*), Schisandraceae (*Schisandra grandiflora*), and Berberidaceae (*Mahonia napaulensis*). Members of Melastomataceae like *Osbeckia* spp.,

Oxyspora paniculata are dominant in this area. *Cryptomeria japonica* has been extensively planted in the sanctuary that was introduced from Japan in the 19th century. *Pinus* and members of Fagaceae have added to the panoramic view of hills in this part. The Upper hill forests area is dominated by *Castanopsis acuminatissima*, *Quercus lamellosa*, *Lithocarpus pachyphyllus*, *Alnus nepalensis*, etc. A number of exotic plants like species of *Eucalyptus* and *Cupressus* have been introduced in this zone. Some type of bamboos, with small population size are visible on the slopes. In the lower and middle zone of the Sanctuary a number of grasses like *Saccharum* spp., *Themeda* spp. have been recorded. *Eulalia patters*, *Isachne albens*, *Oplismenus compositus*, *Sporobolus diander* have occupied a large area. Orchids like *Coelogyne corymbosa*, *Cymbidium elegens*, *Pleione praecox* and several other members of Orchidaceae occur in the Sanctuary.

MATERIALS AND METHODS

Comprehensive floristic surveys have been carried out covering all the seasons to document the flowering plants of the sanctuary. The herbarium specimens were prepared following the standard method (Jain & Rao 1977) and have been deposited in the CAL Herbarium (Central National Herbarium, Botanical Survey of India, Howrah). Plants were identified following some standard literature (including Hooker 1872 – 1896; Hara 1966, 1971; Ohashi 1975; Grierson & Long 1983, 1984, 1987, 1991, 1999, 2001; Noltie 1991, 2000) has been consulted and matched at CAL. For updated nomenclature www.worldfloraonline.org and www.theplantlist.org were regularly consulted. For family delimitation Cronquist (1988) has been followed and for flowering period Das and Chanda (1987) was consulted.

ENUMERATION

The present floristic survey in the Senchal Wildlife Sanctuary led to the record of the 226 species of angiosperms those are quite common in the area. All the recorded species are enumerated below along with their habit, flowering and fruiting period and also the voucher numbers (Table 1).

Table 1. Flowering plants recorded from the Senchal wildlife sanctuary in the Darjeeling district of West Bengal

Plant name with Family	Habit	Flowers & Fruits	Voucher no.
RANUNCULACEAE			
<i>Clematis buchananiana</i> DC.	Shrubby climbers	Sept – Mar	Ghosh 43482.
<i>Ranunculus diffuses</i> DC.	Prostrate Herb	Aug – Oct	Ghosh 41609
<i>Ranunculus subpinnatus</i> Wight & Arn.	Straggling herb	Apr – Nov	Ghosh 41703
MAGNOLIACEAE			
<i>Magnolia doltsopa</i> (Buch.-Ham. ex DC.) Figlar	Tree	Jan – Sep	Ghosh 43435
SCHISANDRACEAE			
<i>Schisandra grandiflora</i> (Wall.) Hook.f. & Thomson	shrubby climber	May – Sep	Ghosh 41610

Plant name with Family	Habit	Flowers & Fruits	Voucher no.
BERBERIDACEAE			
<i>Berberis chitria</i> Buch.-Ham. ex Lindl.	Shrub	Apr – Dec	Ghosh 41668
<i>Mahonia napaulensis</i> DC.	Shrub	Feb – May	Ghosh 41759
FUMARIACEAE			
<i>Dactylicapnos scandens</i> (D. Don) Hutch.	Climbing Shrub	Jun – Oct	Ghosh 41501
BRASSICACEAE			
<i>Capsella bursa-pastoris</i> (L.) Medik.	Herb	Mar – Oct	Ghosh 41680
<i>Nasturtium officinale</i> R.Br.	Herb	Feb – Nov	Ghosh 41617
<i>Rorippa indica</i> (L.) Hiern.	Herb	Mar – Jun	Ghosh 41681
VIOLACEAE			
<i>Viola glaucescens</i> Oudem.	Herb	Jan – Dec	Ghosh 41666
<i>Viola thomsonii</i> Oudem.	Herb	Mar – Jun	Ghosh 43420
POLYGALACEAE			
<i>Polygala arillata</i> Buch.-Ham. ex D.Don	Shrub	Jul – Dec	Ghosh 42859
CARYOPHYLLACEAE			
<i>Drymaria diandra</i> Blume	Herb	Jan – Dec	Ghosh 41721
<i>Drymaria villosa</i> Cham. & Schlecht.	Herb	Mar – Sep	Ghosh 41692
<i>Stellaria patens</i> D.Don	Decumbent Herb	May – Nov	Ghosh 41662
<i>Stellaria sikkimensis</i> Hook.f.	Decumbent Herb	May – Oct	Ghosh 43419
HYPERICACEAE			
<i>Hypericum benghalense</i> S.N. Biswas	Shrub	May – Oct	Ghosh 41728
<i>Hypericum dyeri</i> Rehder	Shrub	Jun – Aug; Sep – Nov	Ghosh 41735
<i>Hypericum hookerianum</i> Wight & Arn.	Shrub	Apr – Jun; Oct – Nov	Ghosh 41742
SAURAUACEAE			
<i>Saurauia napaulensis</i> DC.	Tree	Apr – Oct	Ghosh 42841
MALVACEAE			
<i>Callianthe striata</i> (G.F. Dicks. ex Lindl.)Donnell	Shrub	Jan – Dec	Ghosh 42826
<i>Urena lobata</i> L.	Herb	Sep – Dec	Ghosh 42814
GERANIACEAE			
<i>Geranium nepalense</i> Sweet	Herb	Mar – Nov	Ghosh 43474
<i>Geranium polyanthes</i> Edgew. & Hook.f.	Decumbent Herb	May – Oct	Ghosh 41679

Plant name with Family	Habit	Flowers & Fruits	Voucher no.
BALSAMINACEAE			
<i>Impatiens radiata</i> Hook.f.	Herb	Sep – Dec	Ghosh 41762
RUTACEAE			
<i>Boenninghausenia albiflora</i> (Hook.) Reichb. ex Meissn.	Shrub	May – Dec	Ghosh 43468
<i>Zanthoxylum acanthopodium</i> DC.	Shrub	Apr – Oct	Ghosh 42812
<i>Zanthoxylum oxyphyllum</i> Edgew.	Large shrub	Apr – Oct	Ghosh 42813
AQUIFOLIACEAE			
<i>Ilex dipyrrena</i> Wall.	Tree	Apr – Aug	Ghosh 41655
<i>Ilex insignis</i> Hook.f.	Tree	Mar – Aug	Ghosh 43431
CELASTRACEAE			
<i>Euonymus echinatus</i> Wall.	Climbing Shrub	Mar – Sep	Ghosh 43444
VITACE			
<i>Tetrastigma serrulatum</i> (Roxb.) Planch.	Climber	Jun – Dec	Ghosh 41671
SAPINDACEAE			
<i>Dobinea vulgaris</i> Buch-Ham. ex D.Don	Shrub	Aug – Dec	Ghosh 43496
ACERACEAE			
<i>Acer hookeri</i> Miq.	Tree	Apr – Oct	Ghosh 41657
ANACARDIACEAE			
<i>Rhus griffithii</i> Hook. f.	Tree	Mar – Aug	Ghosh 41715
<i>Rhus succedanea</i> L.	Tree	May – Jul	Ghosh 41722
FABACEAE (PAPILIONOIDEAE)			
<i>Desmodium confertum</i> DC.	Shrub	Aug – Dec	Ghosh 41557
<i>Desmodium sinuatum</i> Blume ex Baker	Shrub	Jul – Dec	Ghosh 43497
<i>Erythrina arborescens</i> Roxb.	Tree	Mar – Oct.	Ghosh 42801
<i>Flemingia macrophylla</i> (Willd.) Merr.	Shrub	Jul – Dec	Ghosh 41543
<i>Parochetus communis</i> D. Don	Creeping Herb	Jan – Dec	Ghosh 43417
<i>Trifolium repens</i> L.	Creeping Herb	Apr – Oct.	Ghosh 41625
ROSACEAE			
<i>Cotoneaster insignis</i> Pojark.	Shrub	Mar – Aug	Ghosh 41601
<i>Fragaria nubicola</i> (Hook.f.) Lacaita	Prostrate Herb	Jan – Jun	Ghosh 41620

Plant name with Family	Habit	Flowers & Fruits	Voucher no.
<i>Neillia thyrsifolia</i> D. Don	Shrub	Apr – Nov	Ghosh 41725
<i>Potentilla lineata</i> Trevir.	Prostrate Herb	Apr – Oct	Ghosh 41643
<i>Prunus persica</i> (L.) Batsch., Betytr. & Entw.	Small Tree	Jan – Jun	Ghosh 43437
<i>Rubus calycinus</i> Wall. ex D. Don	Creeping undershrub	Mar – Jun	Ghosh 41649
<i>Rubus ellipticus</i> Sm.	Shrub	Jan – May	Ghosh 43408
<i>Rubus lineatus</i> Reinwardt. ex Blume	Shrub	Mar – Sep	Ghosh 41738
<i>Rubus niveus</i> Thunb. var. <i>rosaefolius</i> (Hook. f.) H. Hara	Shrub	Mar – Nov	Ghosh 41618
SAXIFRAGACEAE			
<i>Bergenia pacumbis</i> (Buch.-Ham. ex D. Don) C.Y. Wu & J.T. Pan	Robust Herb	Jan – Apr	Ghosh 43410
<i>Saxifraga stolonifera</i> Curtis	Caespitose Herb	Mar - Jul	Ghosh 41704
HYDRANGEACEAE			
<i>Dichroa febrifuga</i> Lour.	Shrub	Jun – Dec	Ghosh 41529
<i>Hydrangea robusta</i> Hook. f. & Thomson	Shrub	Jul - Aug	Ghosh 43485
PHILADELPHACEAE			
<i>Deutzia corymbosa</i> R. Br.	Shrub	Apr – Sep	Ghosh 41624
CRASSULACEAE			
<i>Sedum multicaule</i> Wall. ex Lindl.	Herb	Jan – May	Ghosh 41650
MELASTOMATACEAE			
<i>Osbeckia sikkimensis</i> Craib	Shrub	Aug – Feb	Ghosh 41742
<i>Oxyspora paniculata</i> (D. Don) DC.	Shrub	Jul – Nov	Ghosh 42825
<i>Sarcopyramis napalensis</i> Wall.	Herb	Aug – Jan	Ghosh 42862
APIACEAE			
<i>Hydrocotyle javanica</i> Thunb.	Herb	Sep – Mar	Ghosh 41527
<i>Hydrocotyle nepalensis</i> Hook.	Herb	May – Oct	Ghosh 43475
ARALIACEAE			
<i>Helwingia himalaica</i> Hook. f. & Thomson ex C.B. Clarke	Shrub	Mar – Aug	Ghosh 41711
CAPRIFOLIACEAE			
<i>Leycesteria stipulate</i> (Hook. f. & Thomson) Fritsch.	Shrub	Feb – Jun	Ghosh 41611
<i>Lonicera glabrata</i> Wall.	Shrub	Apr – Nov	Ghosh 43488
<i>Viburnum erubescens</i> Wall. ex DC.	Small Tree	Mar – Aug	Ghosh 41607

Plant name with Family	Habit	Flowers & Fruits	Voucher no.
RUBIACEAE			
<i>Galium elegans</i> Wall. ex Roxb.	Herb	Jun – Oct	Ghosh 41772
<i>Galium mollugo</i> L.	Herb	Jul – Nov	Ghosh 42819
<i>Ophiorrhiza thomsonii</i> Hook.f.	Herb	Mar – Jul	Ghosh 41660
<i>Paederia cruddasiana</i> Prain	Shrubby Climber	Aug – Nov	Ghosh 41556
<i>Rubia manjith</i> L.	Climber	Jun – Nov	Ghosh 42886
VALERIANACEAE			
<i>Valeriana hardwickii</i> Wall.	Herb	Jul – Nov	Ghosh 41740
DIPSACACEAE			
<i>Dipsacus atratus</i> Hook.f. & Thomson ex C.B. Clarke	Herb	Aug – Nov	Ghosh 42861
ASTERACEAE			
<i>Achillea millefolium</i> L.	Herb	Apr – Sep	Ghosh 41667
<i>Ageratum conyzoides</i> (L.) L.	Herb	Jan – Dec	Ghosh 41648
<i>Ainsliaea aptera</i> DC.	Herb	Aug – Dec	Ghosh 41519
<i>Ainsliaea latifolia</i> (D. Don) Sch.-Bip.	Herb	Aug – Dec	Ghosh 42874
<i>Anaphalis contorta</i> (D. Don.) Hook.f.,	Herb	Mar – Jul	Ghosh 41698
<i>Anaphalis hookeri</i> C.B. Clarke	Herb	Aug – Nov	Ghosh 43477
<i>Anaphalis margaritacea</i> (L.) Benth.	Herb	Aug – Dec	Ghosh 41743
<i>Anaphalis triplinervis</i> (Sims.) C.B. Clarke	Herb	Aug – Nov	Ghosh 42858
<i>Artemisia indica</i> Willd.	Herb	Aug – Dec	Ghosh 41723
<i>Bidens pilosa</i> L.	Herb	Jan – Apr	Ghosh 43425
<i>Carpesium cernuum</i> L.	Herb	Aug – Nov	Ghosh 41515
<i>Chromolaena odorata</i> (L.) R.M.King & H. Rob.	Shrub	Nov – May	Ghosh 41664
<i>Duhaldea eupatorioides</i> Steetz.	Undershrub	Aug – Dec	Ghosh 43495
<i>Dichrocephala integrifolia</i> (L.f.) Kuntze	Herb	Feb – Jun	Ghosh 41673
<i>Eleutheranthera ruderalis</i> (Sw.) Sch.-Bip.	Herb	Apr – Aug	Ghosh 41629
<i>Erigeron karvinskianus</i> DC.	Herb	Jan – Dec	Ghosh 41631
<i>Gynura bicolor</i> (Roxb. ex Willd.) DC.	Herb	Aug – Nov	Ghosh 41503
<i>Launaea asplenifolia</i> (Willd.) Hook. f.	Herb	Jan – May	Ghosh 43445
<i>Melanoseris cyanea</i> Edgew	Herb	Aug – Nov	Ghosh 41530
<i>Mikania micrantha</i> Kunth	Climber	Aug – Dec	Ghosh 41565
<i>Montanoa bipinnatifida</i> C.Koch	Shrub	Jan – Apr	Ghosh 43446
<i>Myriactis nepalensis</i> Less.	Herb	Aug – Nov	Ghosh 41754
<i>Prenanthes scandens</i> Hook.f. & Thomson ex C.B. Clarke	Climber	Aug – Dec	Ghosh 41772

Plant name with Family	Habit	Flowers & Fruits	Voucher no.
<i>Saussurea deltoidea</i> (DC.) Sch-Bip.	Herb	Sep – Dec	Ghosh 41521
<i>Synedrella nodiflora</i> (L.) Gaertn.	Herb	Sep – Nov	Ghosh 41551
<i>Synotis alata</i> (Wall. ex DC.) C. Jeffrey & Y.L. Chen	Herb	Jul – Nov	Ghosh 42878
<i>Synotis rufinervis</i> (DC.) C. Jeffrey & Y.L. Chen	Herb	Dec – Mar	Ghosh 43447
<i>Taraxacum campylodes</i> G.E.Haglund	Herb	Apr – Jun	Ghosh 41675
CAMPANULACEAE			
<i>Campanula pallida</i> Wall.	Herb	Sep – Dec	Ghosh 43476
<i>Codonopsis inflata</i> Hook. f. & Thomson	Climber	Aug – Nov	Ghosh 42844
<i>Lobelia nicotianifolia</i> Roth ex Schult.	Herb	Aug – Dec	Ghosh 43470
<i>Lobelia nummularia</i> Lam.	Creeping Herb	Jul – Nov	Ghosh 42810
VACCINACEAE			
<i>Agapetes serpens</i> (Wight) Sleumer	Epiphytic Shrub	Jan – Dec	Ghosh 41504
<i>Vaccinium retusum</i> (Griff.) Hook.f. ex C.B.Clarke	Epiphytic Shrub	Apr – Oct	Ghosh 41612
<i>Vaccinium vacciniaceum</i> (Roxb.) Sleumer	Epiphytic Shrub	Apr – Oct	Ghosh 41678
ERICACEAE			
<i>Lyonia ovalifolia</i> (Wall.) Drude.	Shrub/ small Tree	Mar – Sep	Ghosh 41718
<i>Rhododendron arboreum</i> Sm.	Tree	Jan – Apr	Ghosh 43434
<i>Rhododendron grande</i> Wight	Tree	Jan – May	Ghosh 43436
PRIMULACEAE			
<i>Primula malacoides</i> Franch.	Herb	Jan – Aug	Ghosh 43403
MYRSINACEAE			
<i>Maesa chisia</i> Buch.-Ham. ex D. Don	Shrub	Jan – May	Ghosh 43453
SYMPLOCACEAE			
<i>Symplocos cochinchinensis</i> (Lour.) S. Moore	Tree	Jan – Apr	Ghosh 43429
<i>Symplocos racemosa</i> Roxb.	Tree	Feb – Jun	Ghosh 41613
APOCYNACEAE			
<i>Wrightia tinctoria</i> R.Br.	Tree	Aug – Nov	Ghosh 41538
GENTIANACEAE			
<i>Crawfurdia affinis</i> Wall. ex C.B. Clarke	Climber	Aug – Dec	Ghosh 41506
<i>Crawfurdia japonica</i> Sieb. & Zucc.	Climber	Jul – Dec	Ghosh 42843
<i>Crawfurdia speciosa</i> Wall.	Climber	Aug – Dec	Ghosh 43471
<i>Gentiana capitata</i> Buch.-Ham. ex D.Don	Herb	Jan – May	Ghosh 43439

Plant name with Family	Habit	Flowers & Fruits	Voucher no.
<i>Gentiana pedicellata</i> (D. Don) Wall. ex Griseb	Herb	Jan – Dec	Ghosh 43411
<i>Swertia bimaculata</i> (Sieb et Zucc.) Hook.f. & Thomson ex C.B. Clarke	Herb	Aug – Nov	Ghosh 42860
<i>Swertia chirayita</i> (Roxb. ex Flem.) Karsten	Herb	Sep – Jan	Ghosh 42871
BORAGINACEAE			
<i>Cynoglossum zeylanicum</i> (Vahl ex Hornem.) Thunb. ex Lehm.	Herb	Aug – Nov	Ghosh 41520
CONVOLVULACEAE			
<i>Ipomoea indica</i> (Burm. f.) Merr.	Climber	Jul – Dec	Ghosh 42828
<i>Porana racemosa</i> Roxb.	Climber	Sep – Dec	Ghosh 41563
SOLANACEAE			
<i>Brugmansia suaveolens</i> (Willd.) Sweet	Shrub	Jan – Dec	Ghosh 41793
<i>Cestrum aurantiacum</i> Lindl.	Shrub	Jan – Dec	Ghosh 42834
<i>Physalis peruviana</i> L.	Herb	Aug – Dec	Ghosh 41774
<i>Solanum pseudocapsicum</i> var. <i>diflorum</i> (Vell.) Bitter	Shrub	Mar – Jun	Ghosh 41665
<i>Solanum jasminoides</i> Paxton	Shrubby climber	Jan – Dec	Ghosh 41732
SCROPHULARIACEAE			
<i>Hemiphragma heterophyllum</i> Wall.	Herb	Mar – Sep	Ghosh 41791
<i>Lindenbergia indica</i> (L.) Vatke	Herb	Sep – Sep	Ghosh 43490
<i>Mimulus nepalensis</i> Benth.	Herb	Aug – Dec	Ghosh 41729
<i>Torenia asiatica</i> L.	Herb	Aug – Nov	Ghosh 41799
GESNERIACEAE			
<i>Aeschynanthus bracteatus</i> Wall. ex DC.	Epiphytic undershrub	Mar – Jun	Ghosh 41672
<i>Aeschynanthus parviflorus</i> (D. Don) Spreng.	Epiphytic undershrub	Jul – Dec	Ghosh 42833
<i>Chirita pumila</i> D. Don	Herb	Jul – Nov	Ghosh 42836
<i>Chirita urticaefolia</i> Buch.-Ham. ex D. Don	Herb	Aug – Nov	Ghosh 43489
ACANTHACEAE			
<i>Asystasia macrocarpa</i> Nees	Undershrub	Dec – Mar	Ghosh 43409
<i>Thunbergia coccinea</i> Wall. ex D. Don	Climber	Aug – Dec	Ghosh 41796
<i>Thunbergia lutea</i> T. Anders.	Climber	Aug – Nov	Ghosh 42807
VERBENACEAE			
<i>Lantana indica</i> Roxb.	Shrub	Jan – Dec	Ghosh 41555
LAMIACEAE			
<i>Brunella vulgaris</i> L.	Herb	Ju – Oct.	Ghosh 42879

Plant name with Family	Habit	Flowers & Fruits	Voucher no.
<i>Clinopodium umbrosum</i> (M. Bieb.) Kuntze	Herb	Jul – Nov	Ghosh 41763
<i>Elsholtzia blanda</i> (Benth.) Benth.	Undershrub	Sep – Dec	Ghosh 43493
<i>Elsholtzia ciliata</i> (Thunb.) Hyland	Undershrub	Aug – Nov	Ghosh 43492
<i>Elsholtzia flava</i> Benth.	Undershrub	Aug – Nov	Ghosh 41770
<i>Leucosceptrum canum</i> Sm.	Tree	Jan – May	Ghosh 43432
<i>Melissa axillaries</i> (Benth.) Bakh. f.	Herb	May – Dec	Ghosh 43405
<i>Rabdosia coetsa</i> (Buch.-Ham. ex D. Don) H. Hara	Herb	Aug – Dec	Ghosh 41747
<i>Rabdosia lophanthoides</i> var. <i>gracilliflora</i> (Benth.) H. Hara	Herb	Aug – Jan	Ghosh 42857
<i>Salvia leucantha</i> Cav.	Herb	Apr – Sep	Ghosh 41630
<i>Scutella riaviolacea</i> Heyne ex Benth.	Herb	Aug – Dec	Ghosh 42803
PLANTAGINACEAE			
<i>Plantago asiatica</i> subsp. <i>erosa</i> (Wall.) Z. Yu Li	Herb	Jan – Dec	Ghosh 41523
AMARANTHACEAE			
<i>Achyranthes aspera</i> L.	Herb	Jul – Feb	Ghosh 42891
<i>Achyranthes bidentata</i> Blume	Herb	Jul – Jan	Ghosh 41773
<i>Cyathula capitata</i> Moq.	Herb	Sep – Dec	Ghosh 41512
POLYGONACEAE			
<i>Koenigia mollis</i> (D. Don.) T.M. Schust. & Reveal	Shrub	May – Oct.	Ghosh 41751
<i>Fagopyrum dibotrys</i> (D. Don) H. Hara	Undershrub	Aug – Dec	Ghosh 41778
<i>Persicaria hydropiper</i> (L.) Spach	Herb	Aug – Nov	Ghosh 41733
<i>Persicaria nepalensis</i> (Meissn.) H. Gross	Herb	Aug – Dec	Ghosh 41755
<i>Persicaria possumbu</i> (Buch.-Ham. ex D. Don) H. Gross	Herb	Aug – Feb	Ghosh 43433
<i>Rumex nepalensis</i> Spreng	Herb	Jan – May	Ghosh 41690
THYMELEACEAE			
<i>Daphne bholua</i> Ham. ex D. Don	Shrub	Jan – May	Ghosh 43415
<i>Edgeworthia gardneri</i> (Wall.) Meissn.	Shrub/ small Tree	Jan – May	Ghosh 43430
EUPHORBIACEAE			
<i>Euphorbia pulcherrima</i> Willd. ex Klotzsch	Shrub	Oct. – Feb	Ghosh 41541
MORACEAE			
<i>Ficus neriifolia</i> var. <i>nemoralis</i> (Wall. ex Miq.) Corner	Tree	Apr – Sep	Ghosh 41745
<i>Ficus semicordata</i> Buch.-Ham. ex J.E. Sm.	Small Tree	Feb – Oct.	Ghosh 41548
URTICACEAE			
<i>Boehmeria hamiltoniana</i> Wedd.	Shrub	Jul – Dec	Ghosh 41552

Plant name with Family	Habit	Flowers & Fruits	Voucher no.
<i>Boehmeria macrophylla</i> Horne.	Shrub	Aug – Dec	Ghosh 42822
<i>Elatostema acuminatum</i> Brongn.	Herb	Aug – Nov	Ghosh 42842
<i>Elatostema hookerianum</i> Wedd.	Herb	Nov – Jan	Ghosh 41705
<i>Laportea terminalis</i> Wight	Herb	Apr – Oct	Ghosh 42832
<i>Lecanthus peduncularis</i> (Royle) Wedd.	Herb	Jul – Nov	Ghosh 42802
<i>Pouzolzia bennettiana</i> Wight	Herb	Aug – Dec	Ghosh 41727
<i>Pouzolzia sanguinea</i> (Blume) Merr	Undershrub	Aug – Dec	Ghosh 42867
<i>Pouzolzia sanguinea</i> var. <i>fulgens</i> (Wedd.) H. Hara	Herb	Feb – Sep	Ghosh 41554
<i>Urtica ardens</i> Link	Shrub	Aug – Dec	Ghosh 41749
JUGLANDACEAE			
<i>Engelhardtia spicata</i> Leschen. ex Blume	Tree	May – Feb	Ghosh 41517
BETULACEA			
<i>Alnus nepalensis</i> D. Don	Tree	Sep – Apr	Ghosh 43498
FAGACEAE			
<i>Castanopsis acuminatissima</i> (Blume) A.DC.	Tree	May – Dec	Ghosh s.n.
<i>Castanopsis purpurella</i> (Miq.) N.P. Balakr.	Tree	May – Dec	Ghosh 41522
<i>Lithocarpus pachyphyllus</i> (Kurz) Rheder	Tree	May – Sep	Ghosh s.n.
<i>Quercus lamellosa</i> Sm.	Tree	Apr – Dec	Ghosh s.n.
ORCHIDACEAE			
<i>Coelogyne corymbosa</i> Lindl.	Epiphyte	May – Aug	Ghosh 41638
<i>Cymbidium elegans</i> Lindl.	Epiphyte	Sep – Nov	Ghosh 42804
<i>Dendrobium ochreatum</i> Lindl.	Epiphyte	Sep – Dec	Ghosh 42805
<i>Herminium lanceum</i> (Thunb. ex Sw.) Vujik	Herb	Aug – Oct	Ghosh 43483
<i>Oberonia pyrulifera</i> Lindl.	Epiphyte	Jul – Nov	Ghosh 42847
<i>Pleione praecox</i> (Sm.) D. Don	Epiphyte or lithophyte	Nov – Jan	Ghosh 43458
<i>Satyrium nepalense</i> D. Don	Herb	Aug – Nov	Ghosh 42883
<i>Spiranthes sinensis</i> (Pers.) Ames	Herb	Aug – Nov	Ghosh 43462
ZINGIBERACEAE			
<i>Cautleya gracilis</i> (Sm.) Dandy	Herb	Apr – Nov	Ghosh 41652
<i>Globba racemosa</i> Sm.	Herb	Aug – Dec	Ghosh 41526
<i>Hedychium coronarim</i> Koenig	Herb	Jul – Dec	Ghosh 42840
<i>Hedychium gracile</i> Roxb.	Herb	Jul – Dec	Ghosh 42894
<i>Hedychium spicatum</i> var. <i>acuminatum</i> (Roscoe) Wall.	Herb	Jul – Dec	Ghosh 41766
HAEMODORACEAE			

Plant name with Family	Habit	Flowers & Fruits	Voucher no.
<i>Ophiopogon intermedius</i> D. Don	Herb	May – Nov	Ghosh 41656
LILIACEAE			
<i>Paris polyphylla</i> Sm.	Herb	Mar – Jul	Ghosh 41604
<i>Smilax ferox</i> Wall. ex Kunth	Shrubby climber	Jul – Dec	Ghosh 42880
<i>Smilax minutiflora</i> A.DC.	Shrubby climber	Jan – May	Ghosh 42870
COMMELINACEAE			
<i>Commelina paludosa</i> Blume	Herb	Aug – Nov	Ghosh 41560
<i>Rhopalephora scaberrima</i> (Blume) Faden	Herb	Aug – Nov	Ghosh 41559
<i>Streptolirion volubile</i> Edgew.	Climbing Herb	Jul – Dec	Ghosh 42876
ARACEAE			
<i>Arisaema consanguineum</i> Schott	Tuberous Herb	Mar – Jun	Ghosh 41623
CYPERACEAE			
<i>Carex baccans</i> Nees	Herb	Aug – Nov	Ghosh 41502
<i>Carex filicina</i> Nees	Herb	Apr – Sep	Ghosh 41633
<i>Carex oedorrhampha</i> Nelmes	Herb	Apr – Jul	Ghosh 41603
<i>Cyperus nutans</i> Vahl	Herb	Aug – Oct	Ghosh 42849
<i>Cyperus paniceus</i> (Rottb.) Boeckeler	Herb	Aug – Oct.	Ghosh 42851
<i>Pycnus flavidus</i> (Retz.) Koyama	Herb	Aug – Jan	Ghosh 42823
POACEAE			
<i>Arundinella bengalensis</i> (Spreng.) Druce	Herb	Aug – Feb	Ghosh 42829
<i>Eleusine coracana</i> (L.) Gaertn.	Herb	Aug – Oct	Ghosh 41544
<i>Eragrostis nigra</i> Nees ex Steud.	Herb	Sep – Dec	Ghosh 41784
<i>Eulalia pallens</i> (Hack.) Kuntz.	Herb	Apr – Jul	Ghosh 41714
<i>Garnotia polypogonoides</i> Munro ex Oliv.	Herb	Aug – Dec	Ghosh 41730
<i>Oplismenus compositus</i> (L.) P. Beauv.	Herb	Aug – Dec	Ghosh 41783
<i>Phalaris arundinacea</i> L.	Herb	Apr – Jul	Ghosh 41646
<i>Saccharum bengalense</i> Retz.	Herb	Oct. – Dec	Ghosh 42830
<i>Setaria glauca</i> (L.) P. Beauv.	Herb	Aug – Oct.	Ghosh 42824
<i>Sporobolus diander</i> (Retz.) P. Beauv.	Herb	Aug – Nov	Ghosh 42820

Present survey in the Senchal Wildlife Sanctuary has recorded the occurrence of 226 species of angiosperms representing 174 genera from 69 families. Among the total species, dicotyledons comprises 61 families, 142 genera and 188 species and monocotyledons

comprises 8 families 32 genera and 38 species. Ten dominant families of the area in respect of genera / species are Asteraceae (23/28), Poaceae (11/11), Lamiaceae (8/11), Orchidaceae (8/8), Urticaceae (6/10), Rosaceae (6/9), Fabaceae (5/ 6), Polygonaceae (4/6), Rubiaceae (4/5), and Gentianaceae (3/7). The Sanctuary area is rich in medicinal plants including *Achyranthes bidentata* (stem and root), *Artemisia indica* (whole plant), *Astilbe rivularis* (rhizome), *Berberis chitria* (root), *Brugmansia suaveolens* (fruits), *Dichroa debrifuga* (root), *Drymaria cordata* and *D. villosa* (whole plant), *Hedychium spicatum* (rhizome), *Hydrocotyle javanica* (whole plant), *Mahonia napaulensis* (berries), *Paederia cruddasiana* (leaves), *Polygala arillata* (root), *Rhododendron arboretum* (flower), *Rubus ellipticus* (root), *Valeriana hardwickii* (root), and *Xanthoxylum oxyphyllum* (fruits).

Now it can be concluded that the flora of Senchal Wildlife Sanctuary is not only rich but also host a large number of medicinal plants. However, further detailed survey is essential for proper understanding of the green wealth of the important Protected Area.

Acknowledgements

The authors are thankful to the Director, Botanical Survey of India, Kolkata and Scientist-in-charge, Central National Herbarium, Howrah for providing all facilities and encouragement. Thanks are also due to DFO, Wildlife Division I, Bengal Natural History Museum, Darjeeling and Range Officer, Senchal West Range, Jore-bungalow for their great help during exploration in the field.

LITERATURE CITED

- Cronquist, A. 1988. *Evolution and Classification of Flowering Plants*. 2nd edn., New York Botanical Garden, Bronx, New York.
- Das, A.P. & S. Chanda. 1987. Flowering calender of the Angiospermic flora of Darjeeling hills, West Bengal (India). *Trans. Bose Res. Inst. India* 50(4): 99 – 133.
- Grierson, A. J. C. & Long, D.G. (ed.) 1983, 1984, 1987. *Flora of Bhutan*. Vol. 1 parts 1 - 3, Edinburgh.
- Grierson, A.J.C. & Long, D.G., 1991, 1999, 2001. *Flora of Bhutan*, Vol. 2, Pts.1, 2 & 3. RBG, Edinburgh
- Hara, H. 1966 & 1971. *The Flora of Eastern Himalaya*. Reports I & II. Tokyo University Press, Tokyo.
- Hooker, J.D. 1872 – 1897. *The Flora of British India*, 7 vols. Reeve & Co., London.
- Jain, S.K. & Rao, R.R. 1977. *A Hand Book of Field and Herbarium Technique*. Today & Tomorrow's Publication, New Delhi.
- Noltie, H.J. (ed) 1994, 2000. *Flora of Bhutan* Vol. 3 Parts I & II, Royal Botanic Garden, Edinburgh.
- Ohashi, H. (ed.) 1975. *The Flora of Eastern Himalaya*, 3rd Rep., Tokyo Univ., Tokyo.
- www.worldfloraonline.org
- www.theplantlist.org