

GRASSES OF PERIYAR TIGER RESERVE

JOMY AUGUSTINE, N. SASIDHARAN, A.K. BHARDWAJ* AND K.P. RAJESH

*Non-Wood Forest Products Division,
Kerala Forest Research Institute, Peechi (Kerala)*

Introduction

The Periyar Tiger Reserve is situated in the Idukki District of Kerala along the Western Ghats, between 9° 17' to 9° 37' N latitude and 76° 56' to 77° 25' E longitude. The sanctuary has an area of 777 km². The altitude varies from 150 m at Pamba Valley to 2016 m at Kottamala. The area is drained by the Periyar originating from the Chokkampatti Hills and the Mullayar from Vellimala Hills. The Periyar and Mullayar join at Mullakkudi and form the Mullaperiyar. A dam was constructed across Mullaperiyar in 1895. The construction of the dam created a reservoir with an area of 26 km².

The vegetation is dominated by West Coast tropical evergreen, West Coast semi-evergreen, Southern moist mixed deciduous and South Indian sub-tropical hill forests. It has been estimated that 7% of the area is dominated by Grass growth, (Asari, 1985). In places like Arjunankotta, Kathiramudi, Kumarikulam, Mangaladevi and Uppupara the vegetation is mainly of grasses devoid of trees, whereas in Edappalayam, Manakkavala, Mullakkudi and Thannikudi, the vegetation is Savannah type. Marshy areas found in Anakuthivayal, Kokkara and Nellipparakandam, consist mostly of

grasses and sedges. Though the altitude is above 1900 m in places like Vellimala and Brook's peaks, there is no Montane Grassland in the Reserve.

The dominant grasses in Savannah are *Apluda mutica*, *Capillipedium assimile*, *Chrysopogon hackelii*, *Cymbopogon flexuosus*, *Eulalia trispicata*, *Ischaemum timorensis*, *Themeda cymbaria* etc. The trees commonly seen are *Dillenia pentagyna*, *Phyllanthus emblica*, *Pterocarpus marsupium*, *Terminalia chebula* and *T. paniculata*.

The major grasses in the high altitude grasslands along hills are *Apocopsis manglorensis*, *Arundinella mesophylla*, *Chrysopogon asper*, *C. zeylanicum*, *Cymbopogon caesius*, *Eulalia trispicata*, *Heteropogon contortus*, *Ischaemum commutatum*, *Tripogon bromoides*, etc. The other shrubby and herbaceous species associated with grasses are *Exacum* spp., *Habenaria* spp., *Indigofera pulchella*, *I. wightii*, *Lilium wightianum*, *Pleobophyllum kunthianum*, *Phoenix humilis*, *Pecteilis gigantea*, *Satyrium nepalense*, *Spiranthes sinensis*, etc.

In marshy areas *Coelachne simpliciuscula*, *Eragrostis unioides*,

* Wildlife Preservation Officer, Periyar Tiger Reserve, Thekkady (Kerala)
[Presently Scientist, Wildlife Institute of India, Dehra Dun (U.P.)]

Leersia hexandra, *Panicum repens*, *Paspalum distichum*, *P. scrobiculatum*, *Sacciolepis interrupta* etc. are common. A few sedges like *Cyperus*, *Fuirena*, *Kyllinga*, *Pycnus* and *Rhynchospora* are the major associates.

The grasses frequently seen in the Moist deciduous forests are *Arthraxon nudus*, *Cyrtococcum muricatum*, *C. oxyphyllum*, *Microstegium ciliatum*, *Oryza meyeriana*, *Ottocloa nodosa*, *Panicum notatum*, *Setaria palmifolia* etc.

The evergreen and semi-evergreen forests have dense growths of *Ochlandra* spp. along with other grasses like *Centotheca lappacea*, *Cyrtococcum longipes*, *Lophatherum gracile*, *Microstegium ciliatum*, *Streptagyna crinita*, etc.

The grasses form an important food resource of wild animals. The Periyar Tiger Reserve is known for its rich fauna, particularly larger mammals. Nair *et al.* (1985) recorded the occurrence of 32 species of mammals. The Tiger Reserve has the highest concentration of the two larger herbivores, the Elephant and the Gaur in Kerala. Sambar Deer, the other dominant herbivore is also fairly well represented. Under Project Tiger, the sanctuary was declared as a Tiger Reserve in 1976.

A preliminary study recorded the occurrence of 64 grasses in the Periyar Tiger Reserve (Srivastava *et al.*, 1994). During our studies we could collect 163 species of grasses including bamboos from the Tiger Reserve. The grasses collected are enumerated below. The herbarium specimens are deposited in the Kerala Forest Research Institute Herbarium (KFRI).

Enumeration of species

1. *Alloteropsis cimicina*
2. *Apluda mutica*
A. aristata
3. *Apocopsis mangloreensis*
4. *Aristida hystrix*
5. *Arthraxon lanceolatus*
6. *Arthraxon lancifolius*
7. *Arthraxon meeboldii*

Note : This species was so far known only from Maharashtra. The present collection from the study area is a new record for South India.

8. *Arthraxon nudus*
A. hispidus
9. *Arthraxon quartinianus*
10. *Arundinella ciliata*
A. holcoides
11. *Arundinella leptochloa*
12. *Arundinella mesophylla*
13. *Arundinella pumila*
14. *Arundinella purpurea*
A. fuscata
15. *Arundinella setosa*
16. *Axonopus compressus*
17. *Bambusa bambos*
B. arundinacea
18. *Bothriochloa insculpta*
Amphilophis insculpta
19. *Bothriochloa pertusa*
Amphilophis pertusa
20. *Brachiaria brizantha*

Note : This species has not been reported from Kerala. The present collection from the study area is a new distribution record.

21. *Brachiaria miliiformis*
22. *Brachiaria ramosa*
23. *Brachiaria semiundulata*
24. *Capillipedium assimile*
C. glaucopsis

25. *Centotheca lappacea*
 26. *Chionachne koenigii*
 27. *Chloris barbata*
 28. *Chrysopogon aciculatus*
 29. *Chrysopogon asper*
 30. *Chrysopogon hackelii*
 31. *Chrysopogon zeylanicus*
 32. *Cleistachne sorghoides*
C. stocksii
 33. *Coelachne simpliciuscula*
 34. *Coix lacryma-jobi*
 35. *Cymbopogon caesius*
 36. *Cymbopogon flexuosus*
 37. *Cymbopogon travancorensis*
 38. *Cynodon dactylon*
 39. *Cyrtococcum deccanensis*
 40. *Cyrtococcum longipes*
 41. *Cyrtococcum muricatum*
 42. *Cyrtococcum oxyphyllum*
 43. *Cyrtococcum patens*
 44. *Cyrtococcum trigonum*
 45. *Dactyloctenium aegyptium*
 46. *Dichanthium annulatum*
 47. *Dichanthium foulkesii*
Bothriochloa foulkesii
Amphilophis foulkesii
 48. *Dichanthium oliganthum*
Indochloa oligantha
Heteropogon oliganthus
 49. *Digitaria bicornis*
 50. *Digitaria ciliaris*
Panicum ciliare
Digitaria marginata
 51. *Digitaria griffithii*
 52. *Digitaria longiflora*
 53. *Digitaria setigera*
 54. *Digitaria wallichiana*
 55. *Dimeria connivens*
 56. *Dimeria deccanensis*
 57. *Dimeria lawsonii*
 58. *Dimeria mooneyi*
 59. *Dimeria thwaitesii*
 60. *Echinochloa colona*
 61. *Echinochloa crus-galli*
 62. *Echinochloa stagnina*
 63. *Eleusine indica*
 64. *Eragrostiella bifaria*
Eragrostis bifaria
 65. *Eragrostis atrovirens*
 66. *Eragrostis nigra*
 67. *Eragrostis nutans*
 68. *Eragrostis pilosa*
 69. *Eragrostis tef*
 70. *Eragrostis tenuifolia*
 71. *Eragrostis unioloides*
 72. *Eragrostis viscosa*
 73. *Eulalia trispicata*
Eulalia tristachya
 74. *Garnotia arundinacea*
 75. *Garnotia courtallensis*
 76. *Garnotia elata*
Garnotia scoparia
 77. *Garnotia exaristata*
G. tectorum Hook.
 78. *Garnotia tenella*
 79. *Glyphochloa forficulata*
 80. *Hackelochloa granularis*
 81. *Heteropogon contortus*
 82. *Ichnanthus vicinus*
 83. *Imperata cylindrica*
 84. *Indopoa paupercula*
- Note : This species has not been earlier recorded from Kerala
85. *Isachne bourneorum*
 86. *Isachne globosa*
 87. *Isachne kunthiana*
 88. *Isachne miliacea*
 89. *Isachne setosa*
 90. *Isachne walkeri*
 91. *Ischaemum commutatum*
 92. *Ischaemum indicum*
 93. *Ischaemum mangaloricum*
 94. *Ischaemum nilagiricum*
- Note : This species has not been reported earlier from Kerala.

95. *Ischaemum timorense*
96. *Ischaemum zeylanicolum*
97. *Jansenella griffithiana*
Arundinella avenacea
98. *Leersia hexandra*
99. *Leptochloa uniflora*
100. *Lophatherum gracile*
101. *Microstegium ciliatum*
102. *Ochlandra travancorica*
103. *Oplismenus burmannii*
104. *Oplismenus compositus*
105. *Oropetium thomaeum*

Note : This species has not been recorded from Kerala so far. The present collection thus becomes a new record.

106. *Oryza meyeriana*
O. granulata
O. meyeriana
107. *Oryza rufipogon*
108. *Ottochloa nodosa*
109. *Panicum antidotale*
110. *Panicum brevifolium*
111. *Panicum gardneri*
112. *Panicum maximum*
113. *Panicum notatum*
P. montanum
114. *Panicum psilopodium*
115. *Panicum repens*
116. *Panicum sumatrense*
P. miliare
117. *Panicum trypheron*
118. *Paspalidium flavidum*
119. *Paspalum canarae*
P. compactum
120. *Paspalum conjugatum*
121. *Paspalum distichum*
122. *Paspalum scrobiculatum*
123. *Pennisetum hohenackeri*
124. *Pennisetum polystachyon*
125. *Perotis indica*
126. *Poa annua*
127. *Pogonatherum orinitum*
P. panicum

128. *Pseudanthistiria umbellata*
129. *Pseudoraphis spinescens*
130. *Pseudosorghum fasciculare*
131. *Pseudoxytenanthera bourdillonii*
132. *Pseudoxytenanthera monadelpha*
Dendrocalamus monadelphus
Oxytenanthera monodelpha
133. *Rhynchelytrum repens*
R. villosum
134. *Rottboellia cochinchinensis*
R. exaltata
135. *Saccharum spontaneum*
136. *Sacciolepis indica*
137. *Sacciolepis interrupta*
138. *Sacciolepis myosuroides*
139. *Schizachyrium brevifolium*
140. *Setaria barbata*
141. *Setaria intermedia*
142. *Setaria palmifolia*
143. *Setaria paniculifera*
144. *Setaria pumila*
145. *Setaria verticillata*

Note : The present collection of this species from the study area is a new record for Kerala.

146. *Sinoarundinaria walkeriana*
147. *Sorghum nitidum*
148. *Spodiopogon rhizophorus*
149. *Sporobolus indicus* var. *diander*
150. *Sporobolus indicus* var. *fertilis*
151. *Sporobolus piliferus*
152. *Sporobolus virginicus*
153. *Streptogyna crinita*
S. gerontogaea
154. *Themeda cymbaria*
155. *Themeda tremula*
156. *Themeda triandra*
157. *Tragus biflorus*

Note : This species has not been reported from Kerala. The present collection is a new record for Kerala.

- 158. *Tripogon ananthaswamianus*
- 159. *Tripogon bromoides*
- 160. *Tripogon capillatus*
- 161. *Urochloa panicoides*
- 162. *Zenkeria elegans*
- 163. *Zenkeria sebastinei*

Discussion

The 163 species collected from the Periyar Tiger Reserve under 75 genera belong to 17 tribes. The subfamily Panicoideae is represented by 48 genera and 109 species; Pooideae by 23 genera and 49 species and Bambusoideae by 4 genera and 6 species. Among the 75 genera, *Eragrostis* and *Panicum* have the highest representation with 9 species each. The genera *Arundinella*, *Cyrtococcum*, *Digitaria*, *Isachne*, *Ischaemum* and *Setaria* have 6 species each. Genera with 5 species each are *Arthraxon*, *Dimeria* and *Garnotia*, with 4 species each are *Brachiaria*, *Chrysopogon*, *Paspalum* and *Sporobolus*, represented with 3 species are *Cymbopogon*, *Dichanthium*, *Echinochloa*, *Sacciolepis*, *Themeda* and *Tripogon* and with 2 species are *Bothriochloa*, *Oplismenus*, *Oryza*, *Pennisetum*, *Pseudoxytenanthera* and *Zenkeria*. Forty eight genera are represented by one species.

Sreekumar and Nair (1991) recorded

the occurrence of 296 species under 103 genera belonging to 24 tribes, excluding Bambusoideae from Kerala. Among the 24 tribes, members of Aleuropodeae, Arundineae, Phareae, Thysanolaeneae and Zoysieae are confined to the wet lands and backwater habitats and the tribe Agrostideae is specific to montane grasslands. Since the Periyar Tiger Reserve does not include these habitats, the members of these tribes are hardly represented. Further 107 species prefer the plains including coastal belts. Thus excluding the species belonging to the above groups, the occurrence of 163 species in the Periyar Tiger Reserve shows the richness and diversity of the grass flora.

Among the 163 species recorded, 33 species are endemic to Peninsular India (Sreekumar and Nair, 1991) of which *Arthraxon lanceolatus*, *Cleistachne sorghoides*, *Dimeria connives*, *D. deccanensis* and *Streptagyna crinita* are considered rare and threatened. The following species collected from the Tiger Reserve viz *Arthraxon meeboldii* is a new record for South India and *Brachiaria bryzantha*, *Dimeria mooneyi*, *Indopoa paupercula*, *Oropetium thomaeum*, *Setaria verticillata*, and *Tragus biflorus* are new records of occurrences to Kerala.

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SUMMARY

Periyar Tiger Reserve is known for its rich fauna, particularly larger mammals. Grasses form an important food resource for the wild animals. During the studies on the flora of the Periyar Tiger Reserve, 163 species of grasses belonging to 74 genera were collected including seven species which have not been recorded earlier from Kerala. The species are listed in the alphabetical order. The nomenclature is made up to date. Important synonyms are also provided. Analysis with respect to endemism and rarity is also given.

पेरियार बाघ संरक्षित क्षेत्र की घासें

जोमी आगस्टीन, एन० शशिधरन्, ए०के० भारद्वाज व के०पी० राजेश

सारांश

पेरियार बाघ संरक्षित क्षेत्र अपने सम्पन्न पशु-पक्षियों विशेषतः बड़े स्तनियों के लिए प्रसिद्ध है। जंगली पशुओं के लिए घासें महत्वपूर्ण खाद्य स्रोत हैं। पेरियार बाघ संरक्षित क्षेत्र के पेड़-पौधों का अध्ययन करते समय 74 प्रजातियों की 163 जातियों की घास एकत्रित की गई जिनमें सात जातियां ऐसी हैं जो इससे पूर्व केरल राज्य से मिलती अभिलिखित नहीं हुई हैं। इन जातियों को अकाराधिक्रम से सूचीबद्ध किया गया है। नामकरण अद्यवधि बना दिया गया है। उनके महत्वपूर्ण पर्याय भी दिये गए हैं। क्षेत्र सीमितता और दुर्लभता के विश्लेषण भी दिए गए हैं।

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