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FIELD NOTES ON THE ODONATA AROUND LAKE KAILANA, JODHPUR (RAJASTHAN).

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ABSTRACT

The paper reports 18 species of Odonata at Lake Kailana (Jodhpur, Rajasthan), of which seven are new locality records. Observations on their distribution pattern as well as mating and oviposition in some common species have also been included.

INTRODUCTION

Among the important factors governing the distribution, abundance and habitat selection of Odonata of any water body are its shape and size, water holding capacity, water movement, salinity and the aquatic vegetation. According to Corbet (1962), the distribution of dragonflies is normally affected by the nature of aquatic habitat available. In order to study the dragonflies of the above area, several trips were undertaken to Lake Kailana during 1979-80. It is a perennial artificial freshwater lake (Lat. 16°5' N, Long. 57°3' E), about 12 km NW of Jodhpur. It is a big water body consisting of two different reservoirs namely, Takhatsagar and Pratapsagar (Fig. 1 ; Plates II & III). Pratapsagar was brought into existence in 1893 by constructing an impoundment on the deep hilly Terrain in the NW of Jodhpur city. Later in 1937-38, the flow of flood gates of Kailana in the western basin was also dammed and the

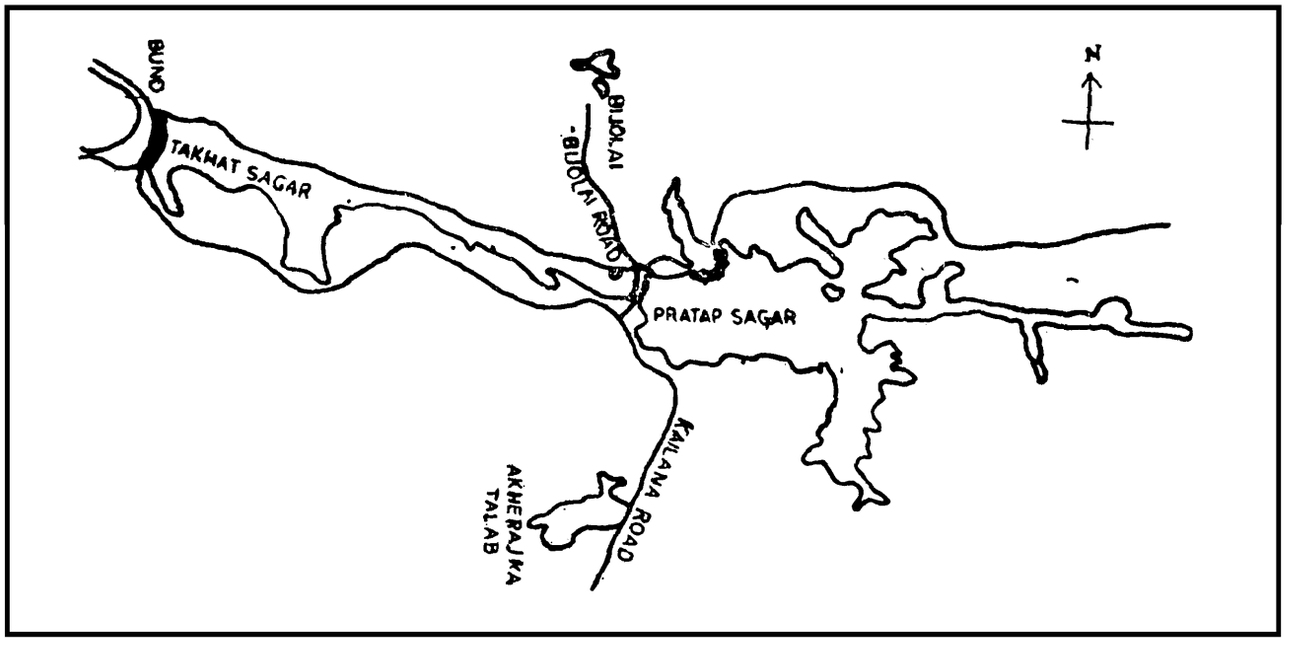

Fig. 1. Sketch map of Lake Kailana showing two parts, *viz.*, Pratapsagar and Takhatsagar.

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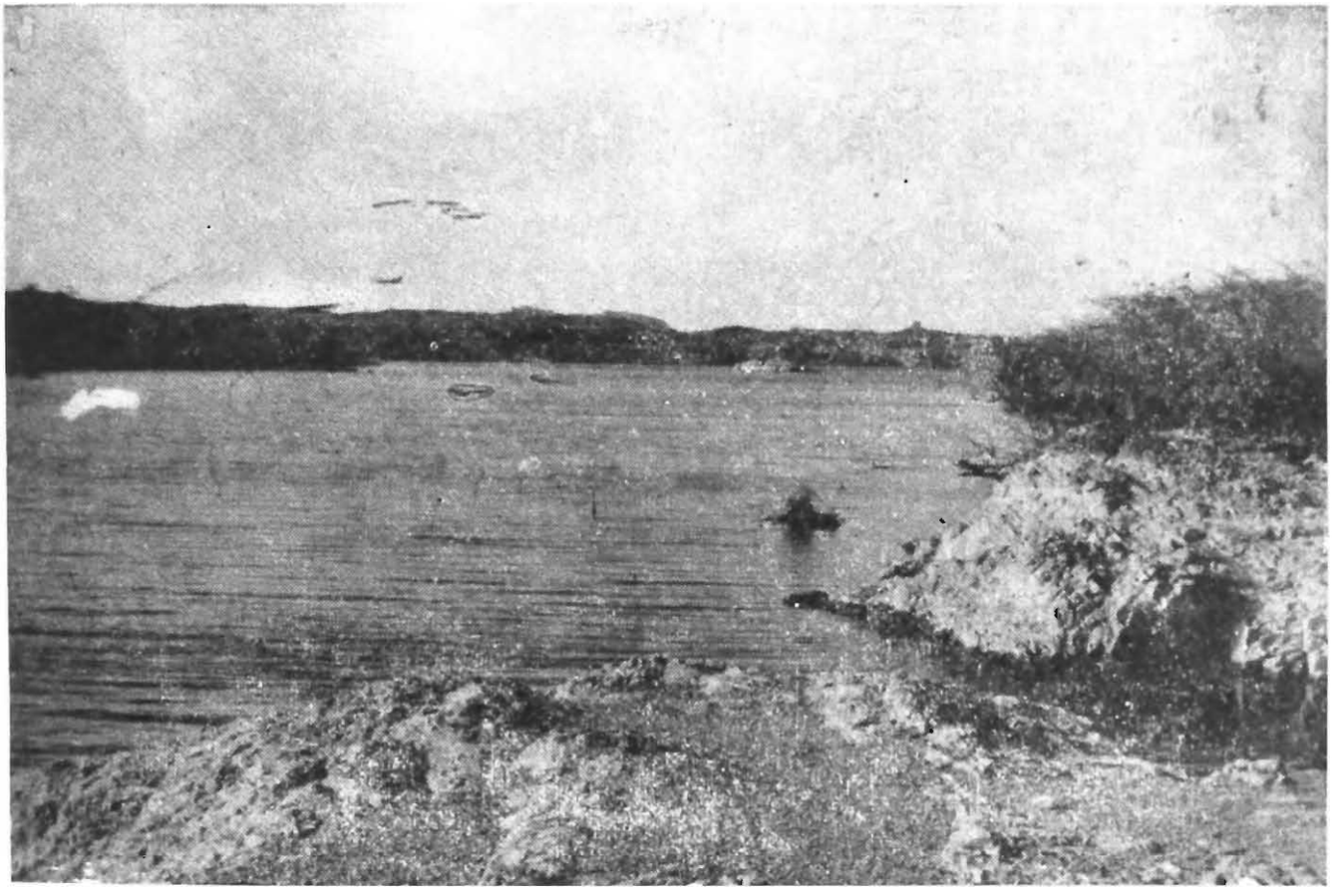
PLATE II



A view of Pratapsagar (Lake Kailana)

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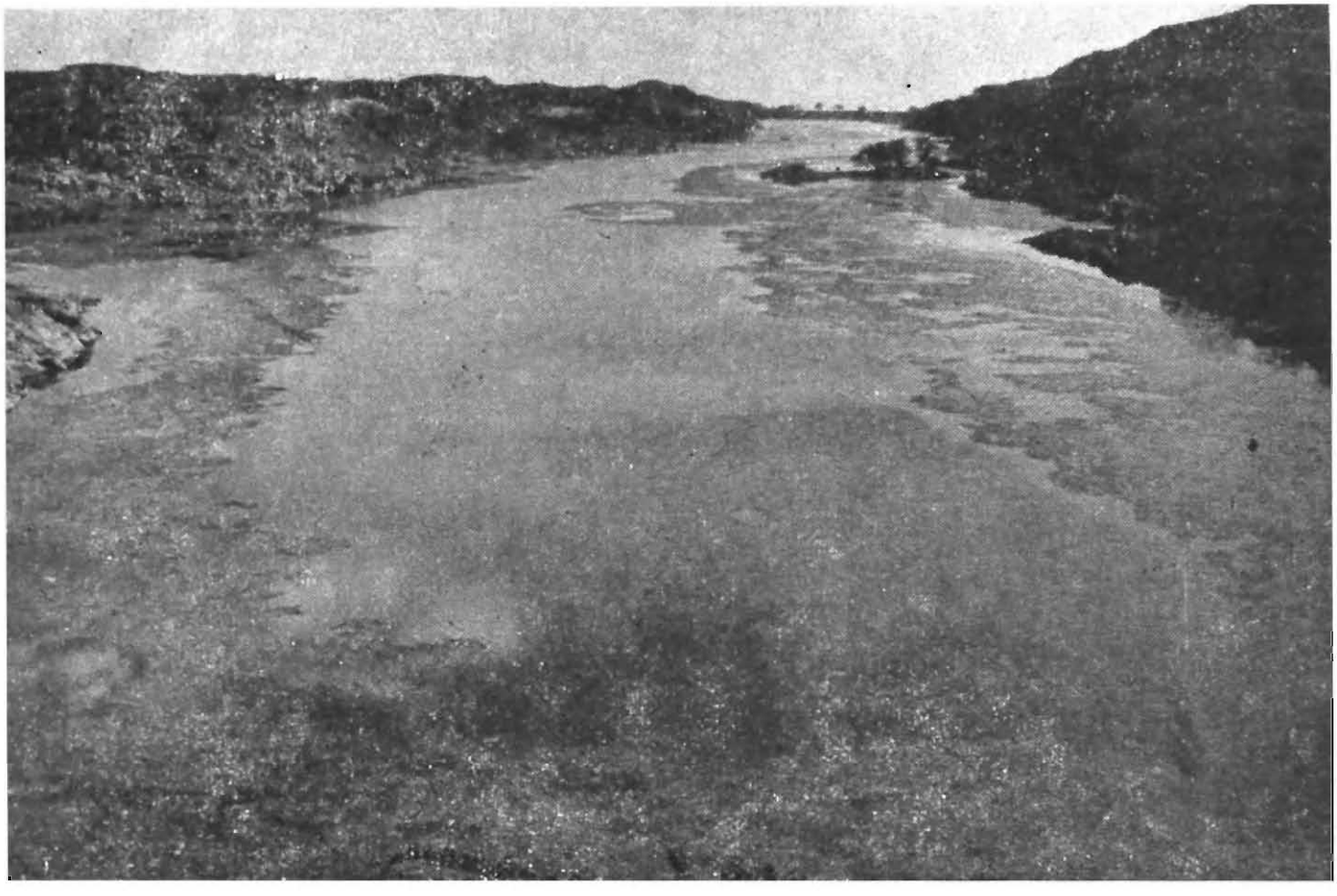
PLATE III



A view of Takhatsagar (Lake Kailana)

reservoir was named Takhatsagar. Pratapsagar can retain 4.65 m. c. m. water, while the water storage capacity of Takhatsagar is 6.11 m. c. m. The rocky drainage basin of Pratapsagar has a spread of 41.40 sq. km. Takhatsagar has no independent catchment area and is fed with water from Pratapsagar, of which the bed level is 7.62 m. higher than the former. Takhatsagar also receives water from Umedsagar which is filled by a canal, carrying water from Jawai dam (Soota *et al.*, 1983). The lake is surrounded by rhyolitic rocks with scanty vegetation. Among the aquatic flora, *Hydrilla*, *Vallisnaria*, *Najas* grass, *Potamogeton* and *Chara* are the aquatic plants which form a natural habitat for the aquatic insects. Around the rocky bank, there are patches of xerophytic vegetation, of which *Acacia jacquamonti*, *A. senegal*, *Aerve persica*, *Boerhavia diffusa*, *Euphorbia caducifolia*, *Prosopis cineraria*, *Salvadora oleoides* and *S. persica* are conspicuous. It has been observed that the dragonflies in Lake Kailana are more abundant along the south-west shore line because on the north-east of the lake there is a sudden steepness of the rocky shores.

The present paper includes fields observations on the distributional pattern of dragonflies around Lake Kailana. Bose and Mitra (1976) reported 13 species and Prasad and Thakur (1981) recorded 16 species of dragonflies from Rajasthan. In the present paper, 18 species of dragonflies are being reported (Table 1). All these species are known from Rajasthan but seven species form new locality records from Lake Kailana. Some species were also reared in the laboratory by collecting their freshly laid eggs and larvae, the results of which are being published elsewhere.

The distribution of these species can be broadly classified in four groups.

(1) Along the deep shore line,

(2) Along rocky bank of lake,

(3) Away from the water near Vegetation,

(4) Species hovering over the water surface.

Along the deep shore line : Species hovering and patrolling along the shore line of the lake are *Copra marginipes*, *Psuedagrion rubriceps*, *Agriocnemis pygmea*, *Trithemis aurora*, *Ictinogomphus rapax*, *Brachythemis contaminata*, *Crocothemis servilia servilia*, *Pantala flevescens*, *Diplacodes lefebvrei* & *D. nebulosa*. Most of these species were observed either perching on the partially submerged vegetation or flying and sometimes ovipositing in the shallow water. Oviposition in *P. rubriceps*, *A. pygmea*, *C. servilia servilia*, was observed in March-April whereas *B. contaminata* has been observed to oviposit in June-July. Adults of *I. rapax* flies very fast and was observed, occasionally perching on vegetation near the bank. Oviposition could not be observed in *I. rapax* as well as *P. flevescens*. *D. lefebvrei* and *D. nebulosa* have been found in very small numbers through out their flight period, recorded from March to September. Adults of *Trithemis pallidinervis* were observed clashing and chasing each other over the open water surface, while adults of *B. contaminata* and *C. servilia servilia* were seen perched in large numbers on the submerged vegetation at the extreme western end of the lake. These preferred flying near vegetation than deep over open water surface. *P. rubriceps* and *A. pygmea* were observed flying lazily at a low level above the surface of the lake, hardly going beyond few metres from the shore line,

Females of both the species were found laying eggs on the submerged *Hydrilla* and *Potamogeton* plants during March-April. The former lays eggs by bending its abdomen over leaves in tandem. *T. aurora* have been observed to lay eggs on stones away from water lying on the lake shore. This species spends most of the time perching on rocks away from vegetation. Their flight range is 303-1000 m. (Kumar and Prasad, 1981). In *T. pallidinervis*, both the sexes were found flying in tandem and female laying eggs in the month of April. *P. flevescens* and *Trithemis fastiva* were found flying actively in May-June. Their flight period extends from March to October. According to Kumar and Prasad (1981), *T. festiva* is one of the first dragonfly which emerge with approach of the spring. *D. nebulosa* and *D. lefebvrei* have also been observed flying actively around larval habitats during April-May.

Along the rocky bank of the Lake : Very few species of Odonata were observed near the rocky bank around the lake. Mostly males of *T. pallidinervis* and *T. aurora* were found flying and perching on the boulders and vegetation near the lake shore from April to August and May to October respectively. Emergence in *T. aurora* takes place during September. Maximum density of its population has been observed during September-October. Males of *I. rapax* has been found flying from one side of the lake to other and intermittently coming over the xerophytic plants on rocky bank. But this species was hardly observed to sit on plants or stones near the shore (observed in March-April) and keeps on flying for hours together. It was recorded only in Takhatsagar, its absence in the Pratapsagar is quite interesting, which shows that its home range is very less. Oviposition could not be observed in this species. Occasionally, *Acisona panorpoides*, *Orthetrum sabina sabina* and *Bridinopyga geminata* were found flying over the rocky bank, being more active on wing during afternoon. Their flight season is from March to November.

Away from the water near vegetation : Eastern part of the lake has only few xerophytic plants. There is no vegetation along the bank of Pratapsagar. Most of the species in this area have been observed to fly along the bank and some species over the water surface. Only *C. servilia servilia*, *I. rapax* and *T. pallidinervis* were found to fly upto vegetation. *C. servilia servilia* were more active and sometimes found sitting over the *Euphorbia* spp. plants whereas other two species were simply flying from one side to other along the vegetation with frequent visits to the lake water. The zygopteran species (*C. marginipes*, *P. rubriceps*, *T. aurora* and *A. pygmea*) were observed flying largely over the water surface and submerged plants in Takhatsagar. Their flight range is very short. They have been observed hovering here and there over the vegetation around the larval habitats during March-September. Western part of the lake has trees of *Acacia* spp and *Prosopis* spp at the extreme end and xerophytic vegetation here and there. A large number of adults of *B. contaminata* and a few of *C. servilia servilia*, *T. pallidinervis*, *D. lefebvrei* and *D. nebulosa* were found flying among the trees. The other species collected include *P. flevescens* and *Orthetrum taeniolatum*.

Species hovering over the water surface : Very few species were observed flying deep over the water surface. Some species (*B. contaminata* and *C. servilia servilia*), have been found to restrict themselves to the

vegetation near the bank. But there are few species such as *I. rapax*, *T. pallidinervis*, *B. geminata*, *P. flevescens* which fly deep over the water surface right upto the other side of the lake. *B. geminata and P. flevescens* were observed from April to September and found to be more common in Takhatsagar near the bridge. Oviposition in *B. geminata* was observed in April and larvae were collected during July-August. In *P. flevescens* oviposition could not be observed, however larvae were collected in the month of September. Kumar (1973) has worked out the detailed life history of *B. geminata*. *D. lefebvrei* and *D. nebulosa*, *T. festiva* and *Orthetrum sabina sabina* also sometimes fly over water surface upto the middle of the lake. But all these species have been observed to lay eggs only along the lake shore among vegetation, water surface or near by stones.

Table 1. *List of Odonata species recorded from Lake Kailana*

(The species marked with asterisk (*) are new records).

Order : Odonata
Sub-Order : Zygoptera
Family : Platycnemidae
Sub-family : Platycneminae
*1. *Copera marginipes* (Rambur)
Family : Coenagrionidae
Sub-family : Psuedagriinae
*2. *Psuedagrion rubriceps* Selys
Sub-family : Ischnurinae
*3. *Ischnura aurora* (Brauer)
Sub-family : Agriocneminae
*4. *Agriocnemis pygmaea* (Rambur)
Sub-order : Anisoptera
Sub-family : Aeshnoidea
Family : Gomphidae
Sub-family : Ictinogomphinae
5. *Ictinogomphus rapax* (Rambur)
Super-family : Libelluloidea
Family : Libellulidae
Sub-family : Libellulinae
*6. *Orthetrum taeniolatum* (Schneider)
*7. *Orthetrum sabina sabina* (Drury)
Sub-family : Branchydiplactinae
8. *Brachydiplax sobrina* (Rambur)
Sub-family : Sympetrinae
9. *Acisoma panorpoides panorpoides* Rambur
10. *Diplacodes nebulosa* (Fabricius)
11. *Diplacodes lefebvrei* (Rambur)
12. *Crocothemis servilia servilia* (Drury)
13. *Bradinopyga geminata* (Rambur)
14. *Brachythemis contaminata* (Fabricius)
Sub-family : Tritheminae
15. *Trithemis aurora* (Burmeister)
16. *Trithemis pallidinervis* (Kirby)
17. *Trithemis festiva* (Rambur)
Sub-family : Pantaliinae
18. *Pantala flevescens* (Fabricius)

Discussion

The present observations reveal that Odonata fauna in Lake Kailana is very meagre qualitatively as will as quantitatively as compared to its size. For such a big lake 18 species cannot be attributed to be a good fauna. The limited species of Odonata may be due to less vegetation. Site selection and larval habitat preference depend on the presence or absence of a particular type of shore vegetation, which in this lake is very poor due to (i) rocky bottom which is

not suitable for rooted vascular plants (ii) absence of littoral zone at many places along the shore due to sudden steepness of the rocky shores (iii) due to poor organic material inflow from outside which are very important for plant growth. As such, aquatic vegetation is available in only restricted parts of the lake. Thus the presence of less vegetation governs the abundance of the Odonata species. This is especially important in those species which oviposit endophytically or have their larvae living amidst the upright vegetation (Kumar, 1978).

Corbet (1962) has dealt various factors in detail which are responsible for the habitat selection and oviposition in dragonflies. Of the 18 species recorded from the lake Kailana, most of the species are common in both the reservoirs Pratapsagar and Takhatsagar, with preponderance of the former (18 *vs.* 8), In fact none of the species of Zygoptera have been recorded from Takhatsagar. Also *I. rapax*, *D. lefebvrei*, *D. nebulosa*, *P. flevescens*, *B. sobrina* are restricted to only Pratapsagar. This can be attributed to the fact that water is being pumped in or out of the lake by high velocities which being responsible for the poor vegetation. This factor along with continuous disturbance in the water, leaves less scope for the dragonflies for habitat selection and oviposition. To sum up Odonata fauna of lake Kailana is very poor in comparison to other freshwater lakes in India such as Renuka lake (1km. long and 300 m. wide) in H. P., where 31 species (Kumar, 1978) have been recorded, while lake Kailana which is much bigger in size has only 18 species.

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