

OPEN ACCESS



The Journal of Threatened Taxa (JoTT) is dedicated to building evidence for conservation globally by publishing peer-reviewed articles online every month at a reasonably rapid rate at www.threatenedtaxa.org. All articles published in JoTT are registered under [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/) unless otherwise mentioned. JoTT allows unrestricted use, reproduction, and distribution of articles in any medium by providing adequate credit to the author(s) and the source of publication.

Journal of Threatened Taxa

Building evidence for conservation globally

www.threatenedtaxa.org

ISSN 0974-7907 (Online) | ISSN 0974-7893 (Print)

NOTE

DO PREDATORY ADULT ODONATES ESTIMATE THEIR ADULT PREY ODONATES' BODY SIZE AND DISPERSAL ABILITY TO PROCEED WITH A SUCCESSFUL ATTACK?

Tharaka Sudesh Priyadarshana

26 June 2021 | Vol. 13 | No. 7 | Pages: 18949–18952

DOI: [10.11609/jott.7198.13.7.18949-18952](https://doi.org/10.11609/jott.7198.13.7.18949-18952)



For Focus, Scope, Aims, and Policies, visit https://threatenedtaxa.org/index.php/JoTT/aims_scope

For Article Submission Guidelines, visit <https://threatenedtaxa.org/index.php/JoTT/about/submissions>

For Policies against Scientific Misconduct, visit https://threatenedtaxa.org/index.php/JoTT/policies_various

For reprints, contact [<ravi@threatenedtaxa.org>](mailto:ravi@threatenedtaxa.org)

The opinions expressed by the authors do not reflect the views of the Journal of Threatened Taxa, Wildlife Information Liaison Development Society, Zoo Outreach Organization, or any of the partners. The journal, the publisher, the host, and the partners are not responsible for the accuracy of the political boundaries shown in the maps by the authors.

Publisher & Host





Do predatory adult odonates estimate their adult prey odonates' body size and dispersal ability to proceed with a successful attack?

Tharaka Sudesh Priyadarshana

Asian School of the Environment, Nanyang Technological University, 50 Nanyang Avenue, 639798, Singapore.
tharakas001@e.ntu.edu.sg, tharakas.priyadarshana@gmail.com

The average body size and dispersal ability of a species significantly depends on its taxonomic order (Siemann et al. 1999). Indeed, there are significant body size and dispersal ability differences between predatory odonates and their typical prey items such as gnats, mayflies, flies, mosquitoes, and other small-sized flying insects. During one of my field visits in Sri Lanka in 2015, I observed an adult dragonfly (*Orthetrum sabina*) eating another species of dragonfly (*O. luzonicum*) (Image 1), and their average body sizes and dispersal abilities were similar. Similar observations were being circulated on Odonate-specialists' Facebook (FB) groups, suggesting that adult odonates feed on other species of odonates or even the same species (see Image 2). When predators prey upon members of the same taxonomic group, it is difficult to predict whether the predators still estimate the size and dispersal ability of their potential prey items to proceed with a successful attack (Woodward & Hildrew 2002). This, however, can be measured by using a robust statistical analysis and a precise dataset.

Even though adult odonates feed upon adult odonates, such records are uncommon. To build the dataset, I surveyed two private FB specialists' groups for such potential records. I manually checked every single post of the "DragonflySouthAsia" ([https://](https://www.facebook.com/groups/dragonflyindia)

www.facebook.com/groups/dragonflyindia) FB group between 2020 to 2016 and posts of the "Dragonfly Interest Group of Sri Lanka" (<https://www.facebook.com/groups/256874097746055>) FB group between 2020 to 2012. I also searched the "Odonata of India" (<https://www.indianodonata.org/>) website for more potential records. For most of those records, predator and prey species had been identified by experts within those groups. Prey odonates that could not be identified to species level due to predation were excluded from the final dataset. The records of mature predators preying upon juveniles were also excluded because that might result in some biases in the dataset as those individuals are immature. The final dataset included 67 records of adult predatory and prey odonate encounters from Sri Lanka (24) and India (43) — nine species of predators and 27 species of prey (see Table 1).

Morphometric trait measurement data related to body size and dispersal ability for each predator and prey odonate was extracted from the "Odonate Phenotypic Database" (OPD) at <http://www.odonatephenotypicdatabase.org/> (Waller et al. 2019). When the data was not available in the OPD (only for eight species), the data was extracted from other published literature (see the Supplementary data for

Editor: Anonymity requested.

Date of publication: 26 June 2021 (online & print)

Citation: Priyadarshana, T.S. (2021). Do predatory adult odonates estimate their adult prey odonates' body size and dispersal ability to proceed with a successful attack? *Journal of Threatened Taxa* 13(7): 18949–18952. <https://doi.org/10.11609/jott.7198.13.7.18949-18952>

Copyright: © Priyadarshana 2021. Creative Commons Attribution 4.0 International License. JOTT allows unrestricted use, reproduction, and distribution of this article in any medium by providing adequate credit to the author(s) and the source of publication.

Funding: Self-funded.

Competing interests: The author declares no competing interests.

Acknowledgements: I thank all those who shared their records and identified predatory and prey odonate species through cyberspace, Christos Mammides for his comments on the first draft, and Subramaniam Gopalakrishnan for the Image 2.

Table 1. Records of adult predator and prey odonate encounters from Sri Lanka (24) and India (43) from 2012 to 2020. Please see the supplementary data for additional information and references.

Record number	Country	Predator odonate species	Prey odonate species
Records of Anisoptera (dragonflies) preying upon Anisoptera (n= 40)			
1	Sri Lanka	<i>Orthetrum sabina</i>	<i>Neurothemis tullia</i>
2	Sri Lanka	<i>Orthetrum sabina</i>	<i>Neurothemis tullia</i>
3	Sri Lanka	<i>Orthetrum sabina</i>	<i>Diplacodes trivialis</i>
4	Sri Lanka	<i>Orthetrum sabina</i>	<i>Orthetrum pruinosum</i>
5	Sri Lanka	<i>Ictinogomphus rapax</i>	<i>Brachythemis contaminata</i>
6	Sri Lanka	<i>Orthetrum sabina</i>	<i>Brachythemis contaminata</i>
7	Sri Lanka	<i>Orthetrum sabina</i>	<i>Orthetrum luzonicum</i>
8	Sri Lanka	<i>Orthetrum sabina</i>	<i>Neurothemis tullia</i>
9	Sri Lanka	<i>Orthetrum sabina</i>	<i>Orthetrum luzonicum</i>
10	Sri Lanka	<i>Orthetrum sabina</i>	<i>Brachythemis contaminata</i>
11	Sri Lanka	<i>Orthetrum sabina</i>	<i>Orthetrum luzonicum</i>
12	Sri Lanka	<i>Orthetrum sabina</i>	<i>Orthetrum pruinosum</i>
13	India	<i>Orthetrum sabina</i>	<i>Neurothemis fulvia</i>
14	India	<i>Orthetrum sabina</i>	<i>Tetrathemis platyptera</i>
15	India	<i>Orthetrum sabina</i>	<i>Diplacodes trivialis</i>
16	India	<i>Orthetrum sabina</i>	<i>Potamarcha congener</i>
17	India	<i>Orthetrum sabina</i>	<i>Diplacodes trivialis</i>
18	India	<i>Orthetrum sabina</i>	<i>Orthetrum sabina</i>
19	India	<i>Orthetrum sabina</i>	<i>Diplacodes trivialis</i>
20	India	<i>Orthetrum sabina</i>	<i>Diplacodes trivialis</i>
21	India	<i>Orthetrum sabina</i>	<i>Orthetrum sabina</i>
22	India	<i>Orthetrum sabina</i>	<i>Orthetrum pruinosum</i>
23	India	<i>Rhodothemis rufa</i>	<i>Neurothemis tullia</i>
24	India	<i>Orthetrum sabina</i>	<i>Rhyothemis variegata</i>
25	India	<i>Orthetrum sabina</i>	<i>Orthetrum pruinosum</i>
26	India	<i>Orthetrum sabina</i>	<i>Potamarcha congener</i>
27	India	<i>Orthetrum sabina</i>	<i>Diplacodes trivialis</i>
28	India	<i>Orthetrum sabina</i>	<i>Orthetrum sabina</i>
29	India	<i>Orthetrum sabina</i>	<i>Orthetrum sabina</i>
30	India	<i>Orthetrum sabina</i>	<i>Crocothemis servilia</i>
31	India	<i>Orthetrum sabina</i>	<i>Trithemis aurora</i>
32	India	<i>Orthetrum sabina</i>	<i>Pantala flavescens</i>
33	India	<i>Orthetrum sabina</i>	<i>Potamarcha congener</i>
34	India	<i>Orthetrum sabina</i>	<i>Diplacodes trivialis</i>
35	India	<i>Orthetrum sabina</i>	<i>Pantala flavescens</i>
36	India	<i>Orthetrum sabina</i>	<i>Trithemis aurora</i>
37	India	<i>Orthetrum sabina</i>	<i>Tholymis tillarga</i>
38	India	<i>Acisoma panorpoides</i>	<i>Acisoma panorpoides</i>

Record number	Country	Predator odonate species	Prey odonate species
39	India	<i>Orthetrum sabina</i>	<i>Orthetrum sabina</i>
40	India	<i>Orthetrum sabina</i>	<i>Paragomphus lineatus</i>
Records of Anisoptera (dragonflies) preying upon Zygoptera (damselflies) (n= 16)			
41	Sri Lanka	<i>Orthetrum sabina</i>	<i>Pseudagrion microcephalum</i>
42	Sri Lanka	<i>Acisoma panorpoides</i>	<i>Ceriagrion coromandelianum</i>
43	Sri Lanka	<i>Orthetrum sabina</i>	<i>Pseudagrion rubriceps</i>
44	Sri Lanka	<i>Orthetrum sabina</i>	<i>Pseudagrion microcephalum</i>
45	Sri Lanka	<i>Orthetrum sabina</i>	<i>Ceriagrion coromandelianum</i>
46	Sri Lanka	<i>Brachythemis contaminata</i>	<i>Pseudagrion rubriceps</i>
47	India	<i>Orthetrum sabina</i>	<i>Onychargia atrocyana</i>
48	India	<i>Orthetrum sabina</i>	<i>Lestes viridulus</i>
49	India	<i>Orthetrum sabina</i>	<i>Ischnura rubilio</i>
50	India	<i>Orthetrum sabina</i>	<i>Ischnura rubilio</i>
51	India	<i>Acisoma panorpoides</i>	<i>Ceriagrion coromandelianum</i>
52	India	<i>Acisoma panorpoides</i>	<i>Agriocnemis splendidissima</i>
53	India	<i>Brachythemis contaminata</i>	<i>Ischnura senegalensis</i>
54	India	<i>Brachythemis contaminata</i>	<i>Ischnura senegalensis</i>
55	India	<i>Orthetrum sabina</i>	<i>Ischnura senegalensis</i>
56	India	<i>Orthetrum sabina</i>	<i>Agriocnemis pygmaea</i>
Records of Zygoptera (damselflies) preying upon Zygoptera (n= 11)			
57	Sri Lanka	<i>Ceriagrion cerinorubellum</i>	<i>Ceriagrion coromandelianum</i>
58	Sri Lanka	<i>Ceriagrion coromandelianum</i>	<i>Agriocnemis pygmaea</i>
59	Sri Lanka	<i>Ceriagrion coromandelianum</i>	<i>Onychargia atrocyana</i>
60	Sri Lanka	<i>Ischnura senegalensis</i>	<i>Agriocnemis pygmaea</i>
61	Sri Lanka	<i>Ceriagrion coromandelianum</i>	<i>Pseudagrion microcephalum</i>
62	Sri Lanka	<i>Ischnura senegalensis</i>	<i>Agriocnemis pygmaea</i>
63	India	<i>Ceriagrion coromandelianum</i>	<i>Ceriagrion cerinorubellum</i>
64	India	<i>Ceriagrion coromandelianum</i>	<i>Ceriagrion cerinorubellum</i>
65	India	<i>Ischnura senegalensis</i>	<i>Agriocnemis pygmaea</i>
66	India	<i>Ceriagrion coromandelianum</i>	<i>Ischnura senegalensis</i>
67	India	<i>Ceriagrion coromandelianum</i>	<i>Agriocnemis pygmaea</i>



Image 1. A mature adult of *Orthetrum sabina* preying upon a mature adult of *O. luzonicum* at Sinharaja rain forest in Sri Lanka, 2015.



Image 2. A mature adult of *Orthetrum sabina* preying upon a mature adult of *O. sabina* at Tirupur, Tamil Nadu in India, 2018.

Table 2. Differences in body size (average body length in mm) and dispersal ability (hind-wing length in mm) between predator and prey odonates when both groups belong to Anisoptera (dragonflies) suborder (n= 40). SD indicates standard deviations, and L-95% and U-95% indicate 95% credible interval (lower and upper, respectively).

	Mean	SD	L-95%	U-95%
Body size of predator odonates	46.500	0.001	46.498	46.502
Body size of prey odonates	39.992	2.415	35.208	44.530
Body size differences between predator and prey odonates	6.507	2.415	6.492	6.522
Dispersal ability of predator odonates	30.500	0.0006	30.498	30.501
Dispersal ability of prey odonates	28.251	1.482	25.287	31.027
Dispersal ability differences between predator and prey odonates	2.248	1.482	2.239	2.257

Table 3. Differences in body size (average body length in mm) and dispersal ability (hind-wing length in mm) between predator and prey odonates when predators belong to Anisoptera (dragonflies) and prey belong to Zygoptera (damselflies) suborder (n= 16). SD indicates standard deviations, and L-95% and U-95% indicate 95% credible interval (lower and upper, respectively).

	Mean	SD	L-95%	U-95%
Body size of predator odonates	45.749	2.037	40.313	46.533
Body size of prey odonates	32.808	1.235	30.371	35.155
Body size differences between predator and prey odonates	12.941	2.252	12.926	12.955
Dispersal ability of predator odonates	30.499	0.003	30.494	30.505
Dispersal ability of prey odonates	18.624	0.871	16.797	20.221
Dispersal ability differences between predator and prey odonates	11.875	0.871	11.869	11.881

Table 4. Differences in body size (average body length in mm) and dispersal ability (hind-wing length in mm) between predator and prey odonates when both groups belong to Zygoptera (damselflies) suborder (n= 11). SD indicates standard deviations, and L-95% and U-95% indicate 95% credible interval (lower and upper, respectively).

	Mean	SD	L-95%	U-95%
Body size of predator odonates	32.984	0.938	31.117	34.820
Body size of prey odonates	28.387	2.477	23.564	33.450
Body size differences between predator and prey odonates	4.597	2.658	4.581	4.614
Dispersal ability of predator odonates	18.600	1.010	16.606	20.324
Dispersal ability of prey odonates	14.359	1.718	10.919	17.829
Dispersal ability differences between predator and prey odonates	4.241	2.009	4.228	4.253

references). The average body length of each predator and prey species considered as the body size and potential dispersal ability was measured with the hind-wing length (only males in mm) for each species (Moretti et al. 2017). To measure whether there is a significant difference in body size and dispersal ability between predatory and prey odonates, I performed a Bayesian t-test using the “BEST” package with flat priors (Kruschke & Meredith 2020). Due to available replicates and data distribution, the Bayesian t-test approach provides a more robust way of estimating posterior probabilities of group differences (Kruschke 2013; Kruschke & Meredith 2020). All the statistical analyses were performed in R version 4.0.3 (www.r-project.org/).

The final dataset showed three types of predation behaviors between the two suborders of Odonata, i.e., (i) Anisoptera (dragonflies) prey upon Anisoptera (60 %, n= 40), (ii) Anisoptera prey upon Zygoptera (damselflies) (24 % of n= 16), and (iii) Zygoptera prey upon Zygoptera (16 %, n= 11), but there was no record of Zygoptera preying upon Anisoptera. Therefore, three separate analyses were performed for each type of predation to estimate the body size and dispersal ability differences between adult predatory and prey odonates. Since each suborder was separately analyzed, the hind-wing length measurements were not scaled relative to body length.

The results of the analysis showed strong evidence that the predatory odonates performing the attack had larger body size and greater hind-wing length than their prey odonates across all three predation types (see Table 2–4). This indicates that predatory adult odonates may estimate the body size and dispersal ability of the adult prey odonates to execute a successful attack even

when both groups belong to the same taxonomic group. *Orthetrum sabina* had the highest percentage with 70 % (n= 47) of attacks on both Anisoptera and Zygoptera species, including *O. sabina-O. sabina* attacks (Image 2). It is also important to note that the attacks of the predatory odonates were mostly on the head or thorax of their prey odonates.

Data accessibility: Supplementary data for this study is available at, <https://github.com/Tharaka18/Predatory-adult-odonates-and-their-adult-prey-odonates>

References

- Kruschke, J.K. (2013). Bayesian estimation supersedes the t test. *Journal of Experimental Psychology: General* 142(2): 573–603. <https://doi.org/10.1037/a0029146>
- Kruschke, J.K. & M. Meredith (2020). BEST: Bayesian estimation supersedes the t test. R package version 0.5.1
- Moretti, M., A.T.C. Dias, F. de Bello, F. Altermatt, S.L. Chown, F.M. Azcárate, J.R. Bell, B. Fournier, M. Hedde, J. Hortal, S. Ibanez, E. Öckinger, J.P. Sousa, J. Ellers & M.P. Berg (2017). Handbook of protocols for standardized measurement of terrestrial invertebrate functional traits. *Functional Ecology* 31(3): 558–567. <https://doi.org/10.1111/1365-2435.12776>
- Siemann, E., D. Tilman & J. Haarstad (1999). Abundance, diversity and body size: patterns from a grassland arthropod community. *Journal of Animal Ecology* 68(4): 824–835. <https://doi.org/10.1046/j.1365-2656.1999.00326.x>
- Waller, J.T., B. Willink, M. Tschol & E.I. Svensson (2019). The odonate phenotypic database, a new open data resource for comparative studies of an old insect order. *Scientific Data* 6(1): 316. <https://doi.org/10.1038/s41597-019-0318-9>
- Woodward, G. & A.G. Hildrew (2002). Body-size determinants of niche overlap and intraguild predation within a complex food web. *Journal of Animal Ecology* 71(6): 1063–1074. <https://doi.org/10.1046/j.1365-2656.2002.00669.x>
- Zhang, H. (2019). *Dragonflies and damselflies of China*. Chongqing University Press, Chongqing, China, xiv+1460pp.





www.threatenedtaxa.org

OPEN ACCESS



The Journal of Threatened Taxa (JoTT) is dedicated to building evidence for conservation globally by publishing peer-reviewed articles online every month at a reasonably rapid rate at www.threatenedtaxa.org. All articles published in JoTT are registered under [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/) unless otherwise mentioned. JoTT allows unrestricted use, reproduction, and distribution of articles in any medium by providing adequate credit to the author(s) and the source of publication.

ISSN 0974-7907 (Online) | ISSN 0974-7893 (Print)

June 2021 | Vol. 13 | No. 7 | Pages: 18679–18958
Date of Publication: 26 June 2021 (Online & Print)
DOI: 10.11609/jott.2021.13.7.18679-18958

Communications

Persistence of *Trachypitecus geei* (Mammalia: Primates: Cercopithecidae) in a rubber plantation in Assam, India

– Joydeep Shil, Jihosuo Biswas, Sudipta Nag & Honnavalli N. Kumara, Pp. 18679–18686

Population assessment of the endangered Western Hoolock Gibbon *Hoolock hoolock* Harlan, 1834 at Sheikh Jamal Inani National Park, Bangladesh, and conservation significance of this site for threatened wildlife species

– M. Tarik Kabir, M. Farid Ahsan, Susan M. Cheyne, Shahrul Anuar Mohd Sah, Susan Lappan, Thad Q. Bartlett & Nadine Ruppert, Pp. 18687–18694

Assessment of changes over a decade in the patterns of livestock depredation by the Himalayan Brown Bear in Ladakh, India

– Aishwarya Maheshwari, A. Arun Kumar & Sambandam Sathyakumar, Pp. 18695–18702

Habitat selection of Himalayan Musk Deer *Moschus leucogaster* (Mammalia: Artiodactyla: Moschidae) with respect to biophysical attributes in Annapurna Conservation Area of Nepal

– Bijaya Neupane, Nar Bahadur Chhetri & Bijaya Dhimi, Pp. 18703–18712

Sero-diagnosis of tuberculosis in elephants in Maharashtra, India

– Utkarsh Rajhans, Gayatri Wankhede, Balaji Ambore, Sandeep Chaudhari, Navnath Nighot, Vitthal Dhaygude & Chhaya Sonekar, Pp. 18713–18718

Avian species richness in traditional rice ecosystems: a case study from upper Myanmar

– Steven G. Platt, Myo Min Win, Naing Lin, Swann Htet Naing Aung, Ashish John & Thomas R. Rainwater, Pp. 18719–18737

Conservation status, feeding guilds, and diversity of birds in Doroji Sloth Bear Sanctuary, Karnataka, India

– M.N. Harisha, K.S. Abdul Samad & B.B. Hosetti, Pp. 18738–18751

Birds of Surat-Dangs: a consolidated checklist of 75 years (1944–2020) with special emphasis on noteworthy bird records and bird hotspots from northern Western Ghats of Gujarat, India

– Nikunj Jambu & Kaushal G. Patel, Pp. 18752–18780

Identification of a unique barb from the dorsal body contour feathers of the Indian Pitta *Pitta brachyura* (Aves: Passeriformes: Pittidae)

– Prateek Dey, Swapna Devi Ray, Sanjeev Kumar Sharma, Padmanabhan Pramod & Ram Pratap Singh, Pp. 18781–18791

Underestimated diversity of *Cnemaspis* Strauch, 1887 (Sauria: Gekkonidae) on karst landscapes in Sarawak, East Malaysia, Borneo

– Izneil Nashriq & Indraneil Das, Pp. 18792–18799

***Aborichthys barapensis*, a new species of river loach (Cypriniformes: Nemacheilidae) from Arunachal Pradesh, the eastern Himalaya, India**

– P. Nanda & L. Tamang, Pp. 18800–18808

A study on the community structure of damselflies (Insecta: Odonata: Zygoptera) in Paschim Medinipur, West Bengal, India

– Pathik Kumar Jana, Priyanka Halder Mallick & Tanmay Bhattacharya, Pp. 18809–18816

New distribution and range extension records of geometrid moths (Lepidoptera: Geometridae) from two western Himalayan protected areas

– Pritha Dey & Axel Hausmann, Pp. 18817–18826

Butterfly diversity of Putalibazar Municipality, Syangja District, Gandaki Province, Nepal

– Kismat Neupane & Mahamad Sayab Miya, Pp. 18827–18845

New records and distribution extension of *Nassarius persicus* (Martens, 1874) and *N. tadjillii* Moolenbeek, 2007 (Mollusca: Gastropoda: Nassariidae) to India

– Sayali Nerurkar & Deepak Apte, Pp. 18846–18852

Flowering plants of Agumbe region, central Western Ghats, Karnataka, India

– G.S. Adithya Rao & Y.L. Krishnamurthy, Pp. 18853–18867

Population assessment and habitat distribution modelling of the threatened medicinal plant *Picrorhiza kurroa* Royle ex Benth. in the Kumaun Himalaya, India

– Naveen Chandra, Gajendra Singh, Shashank Lingwal, M.P.S. Bisht & Lalit Mohan Tewari, Pp. 18868–18877

Occurrence of gilled fungi in Puducherry, India

– Vadivelu Kumaresan, Chakravarthy Sariha, Thokur Sreepathy Murali & Gunasekaran Senthilarasu, Pp. 18878–18887

Short Communications

First photographic evidence and distribution of the Indian Pangolin *Manis crassicaudata* (Mammalia: Pholidota: Manidae) in Sariska Tiger Reserve, Rajasthan, India

– Hemant Singh, Gobind Sagar Bhardwaj, N. Gokulakannan, Saket Agasti & K. Aditya, Pp. 18888–18893

Population and conservation threats to the Greater Flamingos *Phoenicopterus roseus* (Aves: Phoenicopteriformes: Phoenicopteridae) at Basai Wetland and Najafgarh Jheel Bird Sanctuary, Haryana, India

– Amit Kumar & Sarita Rana, Pp. 18894–18898

First report on the occurrence of Sargassum Weed Fish *Histrio histrio* (Lophiliformes: Antennariidae) in Nigeria deep water, Gulf of Guinea

– Abdul-Rahman Dirisu, Hanson S. Uyi & Meshack Uyi, Pp. 18899–18902

A new distribution record of stomatopods *Odontodactylus japonicus* (De Haan, 1844) and *Lysiosquilla tredecimdentata* (Holthuis, 1941) from the Puducherry coastal waters, east coast of India

– S. Nithya Mary, V. Ravitchandirane & B. Gunalan, Pp. 18903–18907

New records of *Agriocnemis keralensis* Peters, 1981 and *Gynacantha khasiaca* MacLachlan, 1896 (Insecta: Odonata) from Maharashtra, India

– Yogesh Koli, Akshay Dalvi & Dattaprasad Sawant, Pp. 18908–18919

A new distribution record of the Horn Coral *Caryophyllia grandis* Gardiner & Waugh, 1938 (Anthozoa: Scleractinia) from the Karnataka Coast, India

– J.S. Yogesh Kumar & C. Raghunathan, Pp. 18920–18924

Re-collection, extended distribution, and amplified description of *Vaccinium paucicrenatum* Sleumer (Ericaceae) from the Arunachal Himalaya in India

– Subhasis Panda, Pp. 18925–18932

Notes

Photographic record of the Rusty-spotted Cat *Prionailurus rubiginosus* (I. Geoffroy Saint-Hilaire, 1831) (Mammalia: Carnivora: Felidae) in southern Western Ghats, India

– Devika Sanghamithra & P.O. Nameer, Pp. 18933–18935

Natural history notes on the highly threatened Pinto's Chachalaca *Ortalis remota* (Aves: Cracidae) 1831

– Carlos Otávio Araujo Gussoni & Marco Aurélio Galvão da Silva, Pp. 18936–18938

Black-bellied Coral Snake *Sinomicrurus nigriventer* (Wall, 1908) (Elapidae): an extended distribution in the western Himalaya, India

– Sipu Kumar, Jignasu Dolia, Vartika Chaudhary, Amit Kumar & Abhijit Das, Pp. 18939–18942

First record of the Afghan Poplar Hawkmoth *Loathoe witti* Eitschberger et al., 1998 (Sphingidae: Smerinthinae) from India: a notable range extension for the genus

– Muzafar Riyaz, Pratheesh Mathew, Taslima Shiekh, S. Ignacimuthu & K. Sivasankaran, Pp. 18943–18946

The tribe Cnodalonini (Coleoptera: Tenebrionidae: Stenochiinae) from Maharashtra with two new records

– V.D. Hegde & D. Vasanthakumar, Pp. 18947–18948

Do predatory adult odonates estimate their adult prey odonates' body size and dispersal ability to proceed with a successful attack?

– Tharaka Sudesh Priyadarshana, Pp. 18949–18952

Rediscovery of *Ophiorrhiza incarnata* C.E.C. Fisch. (Rubiaceae) from the Western Ghats of India after a lapse of 83 years

– Perumal Murugan, Vellingiri Ravichandran & Chidambaram Murugan, Pp. 18953–18955

Response

Comments on the "A checklist of mammals with historical records from Darjeeling-Sikkim Himalaya landscape, India"

– P.O. Nameer, Pp. 18956–18958

Publisher & Host

