

A record of cannibalism in *Ceriagrion coromandelianum* Fabricius (Zygoptera: Coenagrionidae)

PAYRA, Arajush

Ramnagar, Purba Medinipur, West Bengal, India. E-mail: arapayra@gmail.com

Received 01 - VIII - 2020 | Accepted 21 - IX - 2020 | Published 28 - XII - 2020

<https://doi.org/10.25085/rsea.790407>

Registro de canibalismo en *Ceriagrion coromandelianum* Fabricius (Zygoptera: Coenagrionidae)

RESUMEN. Durante la temporada de invierno el 12 de enero de 2014, se observó un caso de canibalismo en *Ceriagrion coromandelianum* Fabricius cerca de Bara Solemanpur, aldea del distrito de Purba Medinipur, Bengala Occidental, India. Este es el primer caso de canibalismo registrado en *C. coromandelianum*, donde una hembra devora a su macho conespecífico.

PALABRAS CLAVE. Inanición. India. Predación intraespecífica.

ABSTRACT. During winter season on January 12th, 2014, a case of cannibalism in *Ceriagrion coromandelianum* Fabricius was observed near Bara Solemanpur, village of Purba Medinipur district, West Bengal, India. This is the first instance of cannibalism recorded in *C. coromandelianum*, where a female devours its conspecific male.

KEYWORDS. India. Intraspecific predation. Starvation.

Cannibalism or intraspecific predation is considered as a usual phenomenon in many natural populations of animals (Fox, 1975). Among the arthropods, this behavioral trait has been observed in many insect orders such as Lepidoptera, Odonata, Hemiptera, Mantodea, Orthoptera, Thysanoptera, Trichoptera, Blattodea, Diptera, Neuroptera, Coleoptera, and Hymenoptera (Capinera, 2008; Richardson et al., 2010). Odonata is a well-known predatory insect order, where cannibalism is frequently seen in larval stages (Ilmonen & Suhonen, 2006), but rather rarely documented in case of adults. Till date, in adult Zygoptera, cannibalism has been documented in several species: *Ceriagrion melanurum* Selys, *C. auranticum* Fraser, *Coenagrion puella* (L.), *Ischnura elegans* (Vander Linden), *I. graellsii* (Rambur), *I. verticalis* (Say), *I. ramburii* Selys, *Enallagma civile* (Hagen), *Pyrrhosoma nymphula* (Sulzer), *Archilestes grandis* (Rambur), *Euphaea dispar* Rambur, and *Hetaerina americana* (Fabricius) (Bick & Sulzbach, 1966; Müller, 1972; Utzeri, 1980; Robertson, 1985; Fincke, 1987; Cordero, 1992; Rolff & Kröger, 1997; Reels, 2010). Herein, a case of cannibalism is reported

for the first time in *Ceriagrion coromandelianum* Fabricius from India.

While snapping some insects of a village garden (21°40'19.08"N; 87°34'29.75"E, 7 m.a.s.l.), near Bara Solemanpur village, Purba Medinipur district, West Bengal, India, on January 12th, 2014, at about 12:30 hs, a female of *C. coromandelianum* devouring a conspecific male was observed (Fig. 1). They were perched on a Marigold tree (*Tithonia* sp.) at about 1.5 feet height from the ground. The distance of nearby water body was about 10 m and the place of observation was characterized by flowering plants of Marigold with grassy vegetation. *Ceriagrion coromandelianum* is a sexually dimorphic damselfly (usually males with citron yellow abdomen and females with olive brown abdomen) widely distributed in the Oriental region (Subramanian et al., 2018). The breeding behavior of this damselfly has also been documented from India (Thaokar et al., 2018), but cannibalism or act of intraspecific predation has never been reported in this damselfly.

According to Fox (1975), factors that trigger the

cannibalism are mainly starvation, density, stress, availability of victim and victim's behavioral pattern. In larval stages of odonates, cannibalism usually occurs due to high population density (Van Buskirk, 1989). In case of adults the reason is still quite vague. Utzeri (1980) first reviewed the instances of cannibalism in adult Zygoptera and in most of the cases teneral and young were involved as prey. According to Utzeri (1980), the instances of cannibalism takes place when intraspecific communication has failed or when the victim is not recognized as conspecific. Thus, he said cannibalism in Zygoptera might be an aspect of ordinary predation. Corbet (1999) has also postulated that, in case of cannibalism in odonates, usually mature adults predate on the teneral males that were unable to perform threat display. Rolff & Kröger (1997) mentioned that cannibalism occurred in adults mostly during or after the cold weather period. As starvation occurred due to the low foraging activities during colder months, that triggers the switch in food selection. The present example was also observed during the colder month of January. But, none of the specimens were examined in the studied area, to confirm whether they were starved or not. So, it will be insignificant to remark the starvation as one of the reasons for cannibalism in the case of the present observation. However, the present observation also supports the hypothesis of sexual cannibalism, which is commonly seen in many species of spiders and mantis (Elgar & Nash, 1988; Lawrence, 1992), where mature females devour the males for the benefit of reproductive success. In Zygoptera, sexual cannibalism was first presented by Cordero (1992) with examples of *Ischnura* damselflies. Interestingly, in the case of the present observation the mature female was devouring a conspecific male, whose colour was olive brown similar to that of female. Also in Zygoptera, cannibalism involved a mature male predated on its mature conspecific female (Reels, 2010). Thus, in the case of zygopteran cannibalism, both sexes acted as predator and prey. As a consequence, it will be fair enough to explain that cannibalism in zygopterans might be an aspect of ordinary predation, as put forward by Utzeri (1980).



Fig. 1. Female *Ceriagrion coromandelianum* devouring a conspecific male on January 12th, 2014 (Near Bara Solemanpur Village, Purba Medinipur district, West Bengal, India)

LITERATURE CITED

- Bick, G.H., & Sulzbach, D. (1966) Reproductive behaviour of the damselfly, *Hetaerina americana* (Fabricius) (Odonata: Calopterygidae). *Animal Behaviour*, **14**(1), 156-158.
- Capinera, J.L. (2008) Cannibalism. *Encyclopedia of Entomology. 2nd Ed.* (Capinera, J.L. ed.), pp. 710-714. Springer, Berlin, Heidelberg.
- Corbet, P.S. (1999) *Dragonflies – Behaviour and Ecology of Odonata*. Cornell University Press, Ithaca, New York.
- Cordero, A. (1992) Sexual cannibalism in the damselfly species *Ischnura graellsii* (Odonata: Coenagrionidae). *Entomologia generalis*, **17**(1), 17-20.
- Elgar, M.A., & Nash, D.R. (1988) Sexual cannibalism in the garden spider *Araneus diadematus*. *Animal Behaviour*, **36**(5), 1511-1517.
- Fincke, O.M. (1987) Female monogamy in the damselfly *Ischnura verticalis* Say (Zygoptera: Coenagrionidae). *Odonatologica*, **16**(2), 129-143.
- Fox, L.R. (1975) Cannibalism in natural populations. *Annual Review of Ecology and Systematics*, **6**(1), 87-106.
- Ilmonen, J., & Suhonen, J. (2006) Intraguild predation, cannibalism, and microhabitat use in *Calopteryx virgo* and *Somatochlora metallica* larvae: a laboratory experiment. *Aquatic Ecology*, **40**(1), 59-68.
- Lawrence, S.E. (1992) Sexual cannibalism in the praying mantid, *Mantis religiosa*: a field study. *Animal Behaviour*, **43**(4), 569-583.
- Müller, K. (1972) Kannibalismus bei *Ischnura elegans* (Vander Linden) während der Paarung (Zygoptera: Coenagrionidae). *Odonatologica*, **1**(1), 51-52.
- Reels, G. (2010) The curious case of the cannibal coenagrionid. *Agrion*, **14**(2), 27.
- Richardson, M.L., Mitchell, R.F., Reigel, P.F., & Hanks, L.M. (2010) Causes and consequences of cannibalism in noncarnivorous insects. *Annual Review of Entomology*, **55**, 39-53.
- Robertson, H.M. (1985) Female dimorphism and mating behaviour in a damselfly, *Ischnura ramburi*: females mimicking males. *Animal Behaviour*, **33**(3), 805-809.
- Rolff, J., & Kröger, C. (1997) Intraspecific predation in immature *Coenagrion puella* (L.): a switch in food selection? (Zygoptera: Coenagrionidae). *Odonatologica*, **26**(2), 215-219.
- Subramanian, K.A., Emiliyamma, K.G., Babu, R., Radhakrishnan, C., & Talmale, S.S. (2018) *Atlas of Odonata (Insecta) of the Western Ghats*. Zool. Surv. Kolkata, India.
- Thaokar, N.R., Verma, P.R., & Andrew, R.J. (2018) Breeding behaviour of the Coromandel Damselfly *Ceriagrion coromandelianum* (Fabricius) (Zygoptera: Coenagrionidae) in central India: copulation. *Journal of Threatened Taxa*, **10**(9), 12203-12209.
- Utzeri, C. (1980) Considerations on cannibalism in Zygoptera. *Notulae Odonatologicae*, **1**, 100-102.
- Van Buskirk, J. (1989) Density-dependent cannibalism in larval dragonflies. *Ecology*, **70**, 1442-1449.