

Bionomics Of the Common Indian Back Swimmer, *Notonecta Anisops Sardea*

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Abstract—The present study deals with the ecology, behaviour, and bionomics of the common Indian back swimmer, *Notonecta anisops sardea*. Observations were made on its habitat, feeding behaviour, life cycle, development, and ecological importance. The species is widely distributed in stagnant and slow-moving freshwater bodies and plays a significant role in controlling mosquito populations.

Index Terms—Back swimmer, Heteropteran insects, *Notonecta anisops sardea*, mosquito control, bionomics.

I. INTRODUCTION

The common Indian back swimmer, *Notonecta anisops sardea*, belongs to the family Notonectidae. Studies on the bionomics of back swimmers are limited. Earlier research on related aquatic Hemipterans includes studies on *Corixa*, *Sigara*, and other genera. However, detailed biological investigations on *Notonecta* species in India remain scarce.

Previous contributions include work by Ekblom (1926), Qadri (1950), Sprague (1956), Rastogi (1962), Patel (1971), and others on Corixidae, while Tonapi and Krandikar (1961) provided limited information on back swimmers. The present study aims to provide a comprehensive account of the biology and ecology of *Notonecta anisops sardea*.

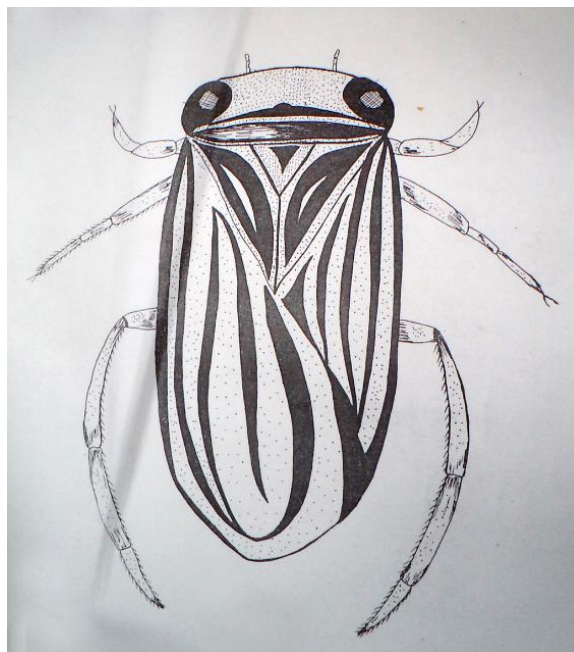


Fig. 1: *Notonecta Anisops Sardea*

II. DISTRIBUTION

Notonecta anisops sardea is widely distributed across India, including Himachal Pradesh, Uttar Pradesh, Bihar, West Bengal, Assam, Odisha, Kerala, Rajasthan, and Madhya Pradesh. It is also found in Myanmar, Sri Lanka, China, Malaysia, and Thailand. The species inhabits ponds, lakes, rivers, and slow-moving water bodies, where it skates on the water surface.

III. MATERIALS AND METHODS

Adult specimens were collected from a pond near Bareilly College, Uttar Pradesh, using a standard pond net. They were cultured in circular glass troughs (30 cm diameter, 15 cm depth) containing pond water and aquatic plants.

- Nymphs were contained using cheesecloth covers
- Water was changed every 10 days
- Food included flies, leafhoppers, and mosquito larvae
- Exuviae were preserved in 70% ethanol
- Laboratory temperature: ~24°C

Observations were made using a dissecting microscope with camera lucida. Measurements were taken using an ocular micrometer, averaging ten specimens.

IV. HABIT AND HABITAT

The species is commonly found in stagnant or slow-moving freshwater bodies. It prefers open water near edges and may occur in groups or individually. Due to rapid movement, capturing them is difficult.

V. FOOD AND FEEDING HABITS

Notonecta anisops sardea is a voracious predator, more active at night. It feeds on:

- Aquatic insects
- Mosquito larvae (Anopheles, Culex)
- Small insects falling on water

Prey is captured using modified forelegs and pierced with the rostrum.

VI. PREDATION

The species is often parasitized by ectoparasitic mites, which attack eggs, nymphs, and adults, sometimes causing mortality.

VII. LOCOMOTION

Locomotion occurs via:

- Skating on water surface
- Swimming using hind legs
- Steering via unequal leg movement

Surface tension plays a key role in supporting body weight.

VIII. FLIGHT

Two forms exist:

- Macropterous (fully winged): capable of flight (mainly nocturnal)
- Brachypterous (reduced wings): incapable of flight. Flight aids dispersal.

IX. ADAPTATIONS

Adaptations for aquatic life include:

- Streamlined, lightweight body
- Waterproof hairy covering
- Air entrapment for respiration
- Specialized legs for locomotion and prey capture

X. SEASONAL BEHAVIOUR

- Active: April–October
 - Winter: Hibernation under debris
 - Dry regions: Aestivation
- Multiple generations may occur annually.

XI. REPRODUCTION

11.1. Sexes

Sexes are separate. Males are smaller and differ in genital structure.

11.2. Mating

Occurs mostly in late afternoon. Duration: ~20–25 minutes.

11.3. Oviposition

Eggs are laid at night on submerged vegetation or surfaces.

- ~15 eggs per batch
- Attached with gelatinous substance

XII. EGG AND DEVELOPMENT

12.1. Eggs

- Shape: Elongated, oval
- Length: ~0.78 mm
- Width: ~0.22 mm
- Colour: Straw-coloured

12.2. Incubation

Duration: ~7 days

12.3. Eclosion

Nymph emerges through a ventral split using abdominal contractions.

XIII. NYMPHAL BEHAVIOUR

- Initially remain underwater briefly
- Begin surface movement after ~2 hours
- Feeding starts after 24 hours

XIV. NUMBER OF INSTARS

There are five instars. Moulting occurs at night, and exuviae float on the water surface.

Instar	Average Duration (Days)
First	7.1
Second	7.6
Third	12.7
Fourth	12.2
Fifth	11.6

Plate – LI: -

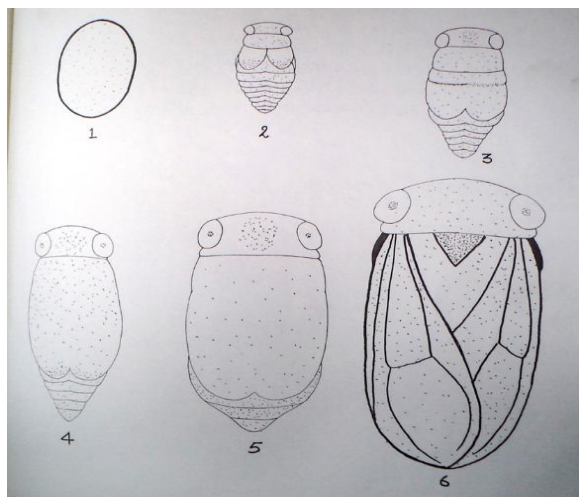


Fig.1 Egg, first instar

Fig.2 First instar

Fig.3 Second instar

Fig.4 Third instar

Fig.5 Fourth instar

Fig.6 Fifth instar

XV. DESCRIPTION OF INSTARS

Each instar shows gradual increase in size, pigmentation, and appendage development. Wing

pads appear in later instars, and sexual differences become visible in the fifth instar.

XVI. ADULT DESCRIPTION

Adults are:

- Streamlined with smooth exoskeleton
 - Possess raptorial forelegs
 - Hind legs adapted for swimming
 - Antennae reduced and hidden
 - Abdomen asymmetrical in females
- They are efficient aquatic predators and can also fly.

XVII. SEXUAL MATURITY AND LONGEVITY

- Sexual maturity: ~6–7 days after emergence
- Egg laying: within ~12 days
- Lifespan: 8–10 months (females live longer)

XVIII. LIFE CYCLE

The life cycle completes in approximately 1.25 to 1.75 months, allowing multiple generations per year.

XIX. ECONOMIC IMPORTANCE

Notonecta anisops sardea plays an important role in biological control by feeding on:

- Mosquito eggs
 - Mosquito larvae (*Anopheles*, *Culex*)
- Thus, it helps in controlling disease vectors.

Plate – LII: -

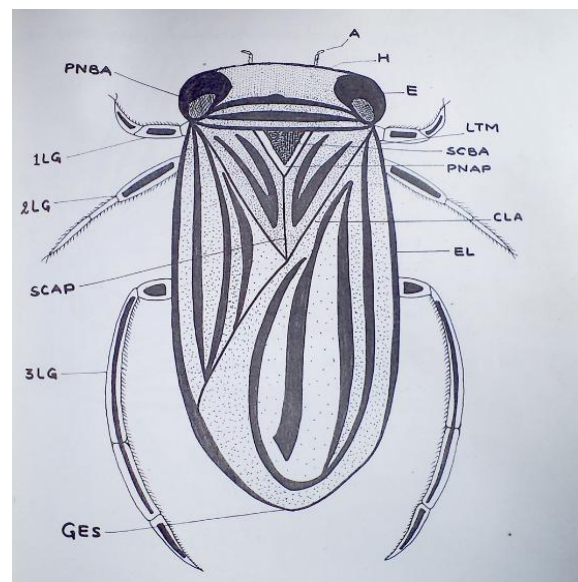


Plate – LII

Imago, *Notonecta Anisops Sardea*.

A	=	Antenna
C	=	Corium
CLA	=	Clavus
E	=	Eye
GE. S	=	Genital segment
H	=	Head
HM	=	Hemelytra.
LR 1 to V	=	Longitudinal ridge, first to fifth
1 LG	=	First leg
2 LG	=	Second leg
3 LG	=	Third leg
LT. A	=	Lateral angle
LT.M	=	Lateral margin
M	=	Membrane
MM.S	=	Membranal suture
PN.AP	=	Pronotum apex
PN.BA	=	Pronotum base
PTL.A	=	Postero-lateral angle
PTL.M	=	Postero-lateral margin
SC.AP	=	Scutellum apex
SC.BA	=	Scutellum base

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