



E-ISSN: 2320-7078

P-ISSN: 2349-6800

Impact Factor (RJIF): 5.83

www.entomoljournal.com

JEZS 2025; 13(6): 33-34

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Received: 18-08-2025

Accepted: 23-09-2025

Somnath BhakatDepartment of Zoology,
Rampurhat College, Rampurhat,
Birbhum, West Bengal, India

Thanatosis (death feigning): A strategy of mate selection in an Asian common toad, *Duttaphrynus melamostictus* (Schneider, 1799)

Somnath BhakatDOI: <https://www.doi.org/10.22271/j.ento.2025.v13.i6a.9625>

Abstract

Thanatosis or death feigning is an antipredator behaviour that benefits the prey by increasing its survival value. Besides this primary function, thanatosis have been reported to play an active role in sexual behaviour. In five species of arthropods, either male or female playing possum select its preferred partner or avoid harassment by unwanted partner. Till today in vertebrates including anurans, there is no report in which death feigning plays a crucial role in mate selection. Here I showed that in Asian common toad, *Duttaphrynus melanostictus*, female avoid mating and male harassment playing thanatosis. Though there is no report of thanatosis controlling sex selection in vertebrates, yet females of robberfly and dragonfly exhibit thanatosis to avoid harassment by males and non-receptive female butterflies of Saturniidae escape male attraction by playing possum. Functional significance of thanatosis in mate selection is very important. Female choice among alternate males and selection of more eligible males results more healthier progeny which have adaptive advantage from evolutionary point of view.

Significance statement: I offer a novel hypothesis focussing on how thanatosis often called death feigning emerged as a strategy of female-based mate selection in toad.

Keywords: Amplexus, antipredator behaviour, belly-up position, female choice

Introduction

Thanatosis is an adaptive behaviour, also known as tonic immobility or death feigning or playing possum or animal hypnosis. It is an antipredator behaviour that involved pretend to death or death feigning (immobilisation reflex) by potential prey that have been detected or seized by a predator^[1]. Thus, it reduces the perception of a predator to further subdue its prey or ceases paying attention^[2]. From evolutionary point of view, thanatosis benefits the prey by increasing its survival value. Thanatosis as a means of protection from predators is widespread taxonomically and has been well known for a long time. Normally it is triggered when the species perceive extreme danger and all other defensive tactics or other options of evasion have failed.

Case report

In our locality (Suri, 87°32'00''E, 23°55'00''N) light and heavy rainfall occurred from June to September and occasionally in October also in each year. One such day was 7th July, 2021, heavy rainfall occurred in the evening followed by light rain throughout the night, an ideal condition of mating of anurans. At 3.30 am, amplexant call of a male drew my attention. I immediately came out of my house and found a pair of Asian common toads (*Duttaphrynus melanostictus*) in amplexus. A small male toad tried to hold a large female toad in the middle of the road. But the female toad was motionless and in a belly-up position with puffed up body. I puzzled and thought that the female is really dead as it was motionless, turning belly up with extended hind limbs and fore limbs exposing palmer surfaces. Both the eyes of the female were partially open. I wanted to verify the female toad, if it is alive or dead. I touched the female's hind limb with a small thin stick, no response i. e. flexion of muscle is observed. I watched the pairs for a few minutes and took two photos with my iPhone. Though male moved slightly and croaked intermittently but the female played possum throughout the period. Then I touched the male with the same stick, it alighted from her belly and slowly leaped away. But the female waked up immediately and jumped away from the spot within a few seconds.

Corresponding Author:**Somnath Bhakat**Department of Zoology,
Rampurhat College, Rampurhat,
Birbhum, West Bengal, India

The female exaggerated death feigning till the male alighted from her belly. Here the male was almost half in size of the female. The male embraced or grasped the female in the arm pit with his left fore-limb correctly and tried to tightened his grip frequently. In amplexus condition, the male is failed to juxtaposed his cloaca with that of the female as it (male) was too small. Moreover, the male was unable to align his body in the middle of the female. Reddish cloacal region of the female indicates that it was fully gravid (Fig. 1).

Discussion

Apart from defence, thanatosis have been reported to control sexual behaviour in only five species of arthropods. A few females of robberfly (*Efferia varipes*) exhibited thanatosis to avoid harassment by males [3]. Male mantids (*Mantis religiosa*) by playing death feigning avoid post-copulatory cannibalism by female [4]. Non-receptive female butterflies of the family Saturniidae, escape male attraction by playing possum behaviour [5]. An interesting sexual behaviour has been observed in nursery web spider, *Pisaura mirabilis*. At the time of mating, the male offers the female a silk-wrapped insect as gift. If the larger female attempts to steal the gift without courtship, the male plays death feigning and is dragged off along with his gift [6]. Thanatosis is a common behaviour for a species of dragonfly (*Aeshna juncea*) in which female avoid male harassment [7].

Among the above mentioned five cases, female controlled mate choice is observed in robberfly, butterfly and dragonfly only. A few vertebrates played death feigning to avoid its predator but till today there is no report of mate choice by using this tactic in any vertebrates. This is the first report in which mate choice is controlled by the female toad by playing thanatosis. In anurans, male always controls the sexual behaviour by the process of amplexus and female have no choice of mate selection except in following two cases. Wood house's toad (*Bufo woodhousei australis*) showed female choice system reproduction in which female prefer male with high call rate for mating [8]. In cane toad, female can choose her mate in a different way. In this case, if a small male grasped or embraced the unwilling female who do not want to have sex with, she inflated her body so that larger rival males can easily dislodged the unwanted male and female could mate with preferred male [9]. In the present report, an unwilling female being able to avoid harassment by smaller and aggressive male by playing thanatosis. This is the third strategy in female-based sex selection in toad in which female shows thanatosis. It was suggested that in bufonids male body size affects female fitness because highest fertilization success can be achieved through mating of similar sized mates and females often benefitted from choosing larger-than-average males [10]. Females who mate with preferred males showed higher fitness than females who mate at random [11]. In the sexual selection, female choice among alternate males has adaptive advantage from the evolutionary point of view. As dominant and larger male have more healthy sperms to fertilize maximum ova to maximize healthy tadpoles. In the present observation, there is no scope to prove if the female finally permitted the larger male to mate as there were no other toads either male or female in the vicinity. There is enough scope for further research on this aspect.



Fig 1: Male and female *Duttaphrynus melamostictus* in thanatosis.

References

1. Mendoza I. Defensive behaviour in *Leptodeira annulate ashmeadii* (Hallowell, 1845). *Herpetotropicos*. 2009;5(1):67.
2. Humphreys RK, Ruxton GD. A review of thanatosis (death feigning) as an antipredator behaviour. *Behav Ecol Sociobiol*. 2018;72:22.
3. Dennis DS, Lavigne RJ. Ethology of *Efferia varipes* with comments on species coexistence. *J Kansas Entomol Soc*. 1976;49(1):48-62.
4. Lawrence SE. Sexual cannibalism in the praying mantid, *Mantis religiosa*: a field study. *Anim Behav*. 1992;43(4):569-583.
5. Shreeve TG, Dennis RLH, Wakeham-Dawson A. Phylogenetic, habitat and behavioural aspects of possum behaviour in European lepidoptera. *J Res Lepid*. 2006;39:80-85.
6. Hansen LS, Gonzales SF, Toft S, Bilde T. Thanatosis as an adaptive male mating strategy in the nuptial gift-giving spider *Pisaura mirabilis*. *Behav Ecol*. 2008;19(3):546-551.
7. Khelifa R. Faking death to avoid male coercion: extreme sexual conflict resolution in a dragonfly. *Ecology*. 2017;98(6):1724-1726.
8. Sullivan BK. Sexual selection in Woodhouse's toad (*Bufo woodhousei*). II. Female choice. *Anim Behav*. 1983;33(4):1011-1017.
9. Bruning B, Phillips BL, Shine R. Turgid female toad gives males the slip: a new mechanism of female mate choice in Anura. *Biol Lett*. 2010;6(3):322-324.
10. Davies NB, Halliday TR. Optimal mate selection in the toad, *Bufo bufo*. *Nature*. 1977;274:683-685.
11. Halliday TR. The study of mate choice. In: Bateson P, editor. *Mate choice*. 1983; p.3-32.