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Insecticidal activity of *Epipremnum aureum* (Araceae) Leaf extract against the Immature Stages of the Rice Moth *Corcyra cephalonica* Stainton, 1866 (Lepidoptera: Pyralidae)

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ABSTRACT: Losses in rice storage due to insect pests drastically affects the food, and one of the serious pests is the rice moth, *Corcyra cephalonica*. Influence of synthetic chemical insecticides has been reported against this pest. Contrary to the chemical insecticides, botanical insecticides or biopesticides derived from plants have been touted as potential alternatives. In the present study, aqueous leaf extract of *Epipremnum aureum* was tested for its efficacy for the first time against the immature stages of *Corcyra cephalonica* at concentrations of 1, 2, 5, 10 and 15% by petridish bioassay method with minor alterations. Significant ovicidal activity with percent egg mortality of 57.3, 65.3, 88.0, 92.0 and 96.0; 36.0, 50.6, 62.6, 82.6 and 92.0; 26.6, 36.0, 37.3, 66.6 and 84.0 was achieved at concentrations of 1, 2, 5, 10 and 15% for the eggs of age 24, 48 and 72 hours, and their respective LC_{50} values were 0.81, 2.03 and 4.28%. However, poor larvicidal activity was noted as they were not able to cause 50% mortality even after 96 hours of exposure. On the basis of the results of the present study, further research is required to explore the phytochemical constituents present in *Epipremnum aureum* leaf extract responsible for the ovicidal activity against *Corcyra cephalonica*.

Keywords: *Corcyra cephalonica*, ovicidal, larvicidal, *Epipremnum aureum*, aqueous leaf extract.

INTRODUCTION

Rice, the staple food of Tamil Nadu is stored for long period of time, and losses in rice storage due to insect pests drastically affects the food. Insects have been associated with stored products throughout the world, majority of which belong to Coleoptera (60%) and Lepidoptera (8-9%) (Atwal and Dhaliwal 2008; FAO, 2009; Nikolaou *et al*., 2021). Stored grain insects can be grouped as primary and secondary pests. The former is capable of successfully attacking, feeding and multiplying on previously undamaged grains, adapted to feed on a narrow range of commodities, able to cause distinctive damage and complete their development within a single grain. The latter, on the other hand, attack and breed in previously damaged grains, complete their life cycle within the grains, and develop on the same food (Salunke *et al*., 2009). Further insect pests of stored products are classified as internal (larvae feed entirely within the kernels/grains/stored materials) and external (larvae and adults feed on the grains/stored products from outside) feeders. The rice moth, *Corcyra cephalonica*, a global storage pest of stored rice grains is pantropical in distribution, seen in tropics and subtropics, Africa, Brazil, Ghana, North and South America, Europe, Asia, Thailand, Myanmar, Indonesia, Sri Lanka and India (Singh and Mishra 1989; Allotey and Azalekor 2000; Patel and Patel 2007; Atwal and Dhaliwal 2008; Yadav, 2011a,b; Roopa *et al*., 2021). It is one of the most notorious external feeder, and a destructive pest of stored grains products, and severely deteriorate agricultural stored products causing severe economic loss (Atwal and Dhaliwal 2008). It attacks rice, wheat, maize, corn, sorghum, groundnut, cotton seeds, oilseeds, pulses, coffee, cereals, spices, cocoa beans, grams, and milled products under storage conditions (Hodges, 1979; Cox *et al*., 1981; Allotey, 1991; Pillai *et al*., 2017). The larvae damages grains by forming silken threads and webs, and feeds inside them, leaving behind its faecal material. While feeding, they spin dense silk tubes and weave the grain kernels into the walls of the tubes (Atwal and Dhaliwal 2008), convert them to frass, making the stored products unfit for human consumption (Frenmore and Prakash 1992). When infestation is high the entire stock of grains may be converted into a webbed mass (Hodges, 1979), leading to dampness produced as a result of the continual secretion of web, prevalence of fungal infection in grains, and a characteristic foul odour develops, making the grains unfit for human consumption (Samanta and Yadav 2021). The webbing formed is noticeably dense and tough with their faecal matter and cast skin adding to the damage caused (Ayyar, 1934; Hodges, 1979; Allotey and Azalekor

2000). The excreta, exuviae and dead bodies also get mixed up in the food stuff, hence causing damage in both quantitative and qualitative loss (Frenmore and Prakash 1992; Verma and Pathak 2018).

The use of fumigants is the most economical tool for the management of stored grain pests, however, these pests rapidly develop resistance (Menge *et al*., 2018). Influence of synthetic chemical insecticides has been reported against this pest (Tiwari and Bhatt 1987, 1992, 1994a,bc, 1999a,b,c, 2000; Dwivedi and Kumar 1999a; Tiwari and Tripathi 2001, 2006; Haung and Subramanyam 2004). But, chemical insecticides poses problems such as pest resistance to pesticides, risk of contamination causing injury to non-target organisms, human health affected, and pollution to environment, thus disturbing the ecosystem. Hence, there is an urgent outcry to develop safe alternatives to conventional insecticides. Botanical insecticides or biopesticides which are derived from plants, have been touted as potential alternatives, as they are eco-friendly in nature, economically viable, non-toxic to non-target animals, human health and environment. Hence, they assumed significance as an important component of insect pest management and hold a promising role as alternatives to chemical insecticides, to reduce pesticide load in the environment. Plants and plant products are useful and desirable tools in pest management programmes because they are effective and often complement the actions of natural enemies (Schmutterer, 1990). Further, Law-Ogbomo (2007) reported that plant treatments of grains have no effect on seed viability and further stated that plant products could reduce the infestation of stored grain pests without causing any deleterious effect on grain quality. *Epipremnum aureum*, a perennial climber, commonly called the money plant, possess medicinal and pharmacological properties (Meshram and Srivastava 2015a) like antimicrobial, antibacterial, antifungal, (Sonawane *et al*., 2011; Srivastava *et al*., 2011; Mehta *et al*., 2013a; Ali *et al*., 2018), anti-inflammatory (Srivastava *et al*., 2015), anticancer (Ali *et al*., 2018), antioxidant (Mehta *et al*., 2013b; Das *et al*., 2015; Meshram and Srivastava, 2016) and antidiabetic (Farswan *et al*., 2022). This plant has been reported for insecticidal properties against termites (Srivastava *et al*., 2011; Meshram and Srivastava 2015b) and pests of stored products, *viz*., *Callosobruchus chinensis*, *Sitophilus oryzae* and *Tribolium castaneum* (Islam *et al*., 2019). Consequently, a preliminary screening attempt was made for the first time to investigate the insecticidal efficacy of *Epipremnum aureum* leaf extracts in the management of rice moths.

MATERIALS AND METHODS

Plant collection and extract preparation. Mature and healthy leaves of *Epipremnum aureum* were collected from Pudukadai, Kanyakumari, Tamil Nadu, India (10° 22' 46.73"N and 78° 49' 17.00"E). Taxonomical identity of the plant was confirmed at at the Department of Botany, Scott Christian College, Nagercoil, Kanyakumari, Tamil Nadu, India. The leaves were then brought to the laboratory, washed in dechlorinated water, shade dried and powdered with the aid of an electric blender. The powdered leaves (1Kg) were extracted with distilled water (3L) in a Soxhlet apparatus (Vogel, 1978), and the crude leaf extract thus obtained was stored in air tight amber coloured bottles at 4°C for bioassay.

Corcyra cephalonica. This moth was first identified and reported by Stainton (1866), who named it *Melissoblaptes cephalonica*. Later, Ragonot (1885) gave the generic name *Corcyra*, and Ayyar (1919) made the first record of *Corcyra cephalonica*, the only recognized species of this genus. Adults are nocturnal, and each female lays about 90-300 eggs with an incubation period of 5 days, 27-30 days of larval period, 10 days of pupal period, and adult life span of one week (Frenmore and Prakash 2009). Eggs of this moth are glistening pearly white in colour (2 to 5 days). The first instars are dirty white in colour with pale yellowish colour head capsule (4 to 5 days), second instars have a yellowish brown colour head capsule (6 to 7 days); third instars have a dark brown head capsule (5 to 6 days); fourth instars are dirty white in colour with a dark border line (5 to 6 days), and the fifth instars are dirty white in colour and cylindrical in shape (7 to 8 days). Pupae are leathery brown coloured enclosed in a cocoon, elongate and elliptical at one end (7 to 9 days). Adults are dark greyish-brown in colour with a few dark hair lines (6 to 8 days). Sex distinction at the adult stage is based on the structure of the abdomen, bulged abdomen with anal tuft (also greater size moth) are females, and narrower abdomen are males. Greater distance with the V shape mark indicates female, whereas less distance without the V mark indicates male (Shailaja *et al.*, 2008).

Culture of *Corcyra cephalonica.* Parent stock culture of *Corcyra cephalonica* obtained from Tamil Nadu Agricultural University, Tamil Nadu, India were placed in cylindrical glass jars (29cm depth; 25cm diameter) covered with a fine muslin cloth at the top. The culture was reared in the laboratory at 28±1°C, 65±5% relative humidity under a photoperiod of 12 hours light and dark cycle, provided with coarsely crushed fresh rice grains. From this culture, whenever needed, newly emerged males and females were transferred to oviposition glass chambers (35mm diameter; 200mm height). Food was not provided to them during their confinement in these vessels, as the adult stages do not feed. Eggs laid by the females were collected and then placed in glass chambers (250mL beakers) for hatching (Tiwari, 2019). Freshly hatched larvae were allowed to feed on a normal dietary medium mixed with 5% (w/w) yeast powder kept inside glass chambers for 15 days (Allotey and Azalekor 2000).

Ovicidal bioassay. For this bioassay, the eggs laid by the females of the F_1 generation from the culture was used. An egg-laying apparatus (Allotey, 1985; Allotey and Goswami, 1990) consisting of plastic jars (9cm diameter; 14cm depth) was used as oviposition cage. Each jar containing 10 pairs of newly emerged adults was inverted over a glass petridish lined with Whatman

No. 1 filter paper at the bottom. The filter paper provided a rough surface for oviposition. Eggs laid were collected from the filter paper with a camel soft fine hair brush. Only un-collapsed eggs (examined under stereo microscope) were used for this study. The date of egg laying were recorded in order to select the eggs of known age needed for the present study. Eggs of 24, 48 and 72 hours old age each were used for this study. Mason *et al*. (1991) methodology of petridish bioassay was adopted with minor changes for the present study. Test concentrations of 1, 2, 5, 10 and 15% of *Epipremnum aureum* leaf extracts (1mL) each was uniformly spread on a Whatman No. 1 filter paper placed inside the lower inner surface of the petridish (10cm diameter). To each petridish, 15 un-collapsed eggs of each age were introduced separately with the aid of a camel soft fine hair brush, and the lower petridish was closed with its upper petridish. Finely crushed rice grain particles were placed around the eggs in order for the newly emerged larvae to commence feeding immediately after hatching, and to avoid egg cannibalism (Allotey and Goswami 1990). Eggs in control were treated with the same volume of distilled water only. Five replicates for each treatment were set up. A total of five trials were run with five replicates per trial. Petridishes containing the control and treated eggs were observed for egg hatchment after a week. The eggs that failed to hatch were noted, and the percentage of inhibition in egg hatch was recorded, and the egg mortality rate was calculated (Zambare *et al*., 2012).

Larvicidal bioassay. The same set of concentrations tested for ovicidal bioassay and the petridish methodology was applied in this bioassay too. Fifth instar larvae separated from the stock culture was tested. To each petridish, 15 larvae (16±1 days old) were introduced. Five replicates of each treatment were set up, and larval mortality was determined after 24, 48, 72 and 96 hours post exposure, and the number of dead larvae was noted to find the percentage of larval mortality (Pathak and Tiwari 2012). Larvae in control were treated with the same volume of distilled water only. Larvae incapable of rising from the surface or not showing characteristic movement were considered moribund.

Statistical analysis of data. Percent mortality was calculated, and control mortality (5-20%) if any, was corrected using Abbott's (1925) formula. Statistical analysis of all data were conducted in IBM SPSS Statistics Version 27.0 with significance set at 95% confidence (SPSS, 2021). Mortality data were subjected to probit analysis. One-way ANOVA and Tukey HSD post-hoc tests were used to determine if the mortality in treated bioassays significantly differed from that of the controls and at which doses in particular, and the differences were considered significant at $P \leq 0.05$ level.

RESULTS AND DISCUSSION

The crude aqueous leaf extracts of *Epipremnum aureum* exhibited good ovicidal activity against *Corcyra cephalonica* (Table 1). Percent egg mortality of 57.3, 65.3, 88.0, 92.0 and 96.0; 36.0, 50.6, 62.6, 82.6 and 92.0; 26.6, 36.0, 37.3, 66.6 and 84.0 was achieved at concentrations of 1, 2, 5, 10 and 15% for the eggs of age 24, 48 and 72 hours (Fig. 1). Their respective LC_{50} values were 0.81, 2.03 and 4.28% (Table 3). However, the same extracts showed poor larvicidal activity, as they were not able to cause 50% mortality even after 96 hours (Table 2; Fig. 2). The LC_{50} values were 42.67, 63.88, 43.57 and 18.53% after 24, 48, 72 and 96 hours of exposure, respectively (Table 3). Overall assessment indicated this extract to have a strong ovicidal effect.

Oils, powders and extracts of plants have caused egg hatching inhibition in *Corcyra cephalonica*. Plant oils of ajowan, betel, citridora, citronella, geranium, lemon grass, marigold, neem, oil tree, pine, rosemary and sweet basil recorded ovicidal effect (Dwivedi and Garg 2000; Sharma and Bhargava 2001; Sowmya *et al*., 2023), and botanical powders obtained from leaves of neem, lantana, custard apple and eucalyptus, flowers of marigold, rhizome of turmeric and ginger, seed kernel of neem, and garlic bulb caused reduction in egg hatchability (Ramanaji *et al*., 2020). Ovicidal properties by plant extracts are reported against *Corcyra cephalonica* (Pandey *et al*., 1985; Chander and Ahmad 1986; Chauhan *et al*., 1987; Bhargava and Urs 1993; Srivastava and Bhatt 1993; Ghatak and Bhusan 1995; Dwivedi and Garg, 2000; Sharma and Bhargava, 2001; Dwivedi and Pareek 2003; Kumar and Jain 2004; Meena and Bhargava, 2010; Shukla and Tiwari, 2011a). Petroleum ether extracts of *Withania somnifera*, *Vinca rosea*, *Cassia occidentalis*, *Chenopodium album*, *Argemone mexicana* and *Helianthus annus* exhibited 100.0, 96.7, 86.7, 70.0, 23.4 and 23.4 percentage of hatching inhibition, respectively (Dwivedi and Kumar 1999b). Acetonic seed extracts of *Ricinus communis*, *Gossypium arboreum*, *Momordica charantia*, *Nyctanthes arbortristis* and *Cassia fistula* exhibited ovicidal action of 100.0, 98.2, 96.5, 93.0 and 80.7%, respectively (Dwivedi and Yadav 2006). Chloroform extracts of *Semecarpus anacardium* seeds, *Argemone mexicana* and *Nerium oleander* leaves and *Euphorbia tirucalli* phylloclade caused 30.0, 36.7, 50.0 and 53.4%; 36.7, 53.4, 56.7 and 66.7%; 43.4, 46.7, 50.0 and 50.0%; 16.7, 23.4, 40.0 and 43.4% egg mortality at 1, 2, 3 and 4mL concentrations, respectively (Zambare *et al*., 2012). Petroleum ether extracts of *Piper nigrum* fruits and *Jatropha curcas* seeds exhibited 59, 49, 27, 22 and 9%; and 58, 48, 32, 20 and 8% egg hatching at concentrations of 2, 4, 6, 8 and 10µL/mL, respectively (Khani *et al*., 2013). Hexane and diethyl ether leaf extracts of *Vitex agnus-castus*, *Pongamia pinnata*, *Ricinus communis*, *Azadirachta indica* and *Annona muricata* caused 90.5 and 66.0, 84.5 and 50.5, 92.0 and 53.5, 77.0 and 45.5, 63.0 and 46.0% ovicidal activity, respectively (Gayathri *et al*., 2015). Acetone leaf extract of *Ricinu scommunis* showed 58.0% egg mortality (Garg and Kumari 2019). Chloroform, ethyl acetate, hexane, petroleum ether, aqueous and methanol extracts of *Tithonia diversifolia* flowers caused 91.25, 81.25, 83.75, 65.0, 41.25 and 97.50 percentage inhibition of egg hatchability, and their respective LC_{50}

values were 0.99, 0.50, 0.74, 1.42, 2.43 and 0.53% (Roopa *et al*., 2021). The results of the present study when compared with these previous reports indicate a significant good ovicidal action by the aqueous leaf extract of *Epipremnum aureum*.

Plant extracts interfere with the normal embryonic development in insects. Ovicidal effect may be due to easy penetration of phytocompounds present in the extract through the delicate covering of vitellin and chorion membrane, thereby increasing the egg mortality rate (Don Pedro, 1989). High percentage of egg mortality in the present study is assumed to be caused by the active phytocompounds present in the extract which might have disrupted blastokinesis, and induced impaired larval hatching. Phytotoxic compounds have been reported to interfere in the process of embryogenesis and cause mortality among the embryo. This activity commonly referred to as ovicidal activity is mainly dependent upon the active phytotoxic compounds present. Therefore, their prevalence in plant parts, the methods and solvents used for extraction, the formulation and mode of delivery, influence ovicidal activity. In addition, other factors such as the age of the egg, adhesion/penetration of the phytocompound, their mode of action, are said to play an effective role in causing mortality. Age of the egg influence the ovicidal activity of compounds as exposure of freshly laid eggs to phytotoxins cause higher mortality rates. This statement supported the present study as freshly laid eggs exposed to various concentrations of extract showed higher egg mortality, as exposure of eggs to the phytotoxins/extracts at the time of oviposition affects embryogenesis. Higher concentrations always yielded better mortality rates and this was observed in the present study too, because, more amount of phytochemicals enter the egg shell, and affects embryogenesis. Phytochemicals induce the inhibition of egg hatchability as they enter into eggs via aeropyles (tiny holes of chorion) connected with the respiration of embryos leading to non-hatchability of eggs. Phytocompounds such as flavonoids acts as an effective ovicide when treated at the early stages of egg development and higher concentration of these phytocompounds cause maximum egg mortality (Samuel *et al*., 2015). This statement could be corroborated to the present study, as the flavonoids present in the aqueous leaf extract of *Epipremnum aureum* (Sonawane *et al*., 2011; Zehraw *et al*., 2022) would have brought egg mortality.

Plant extracts have caused mortality to the larval instars of *Corcyra cephalonica*. One hundred percent mortality was caused to the third instar larvae by *Dryopteris filix-mas* root and rhizome ethanolic extract (Shukla and Tiwari 2011b); acetonic seed extract of neem (Pathak and Tiwari 2012), and by the pyrethrum extract from *Chrysanthemum cinerariifolium* flowers (Shukla and Tiwari 2012). Chloroform, acetone and methanol leaf extracts of *Argemone mexicana* caused 90.0, 70.0 and 100.0% mortality to the fourth instar larvae (Kangade and Zambare 2013). Petroleum ether extracts of *Piper nigrum* fruits and *Jatropha curcas* seeds caused 88.9% and 98.0% mortality to the third instar larvae after 72 hours (Khani *et al*., 2013). Ethanolic leaf extracts of *Argemone mexicana*, *Nerium oleander* and *Parthenium hysterophorus* caused 76.0, 83.0 and 81.0% mortality (Khan and Qamar 2015); and *Tylophora indica* recorded 100% mortality against the fifth instar after 96 hours (Jincy *et al*., 2021). Chloroform, ethyl acetate, hexane, petroleum ether, aqueous and methanol extracts of *Tithonia diversifolia* flowers caused larval mortality that ranged from 72.5 to 100% (Roopa *et al*., 2021). Further, the extracts of *Annona squamosa* seeds, *Tephrosia purpurea* aerial parts and *Acorus calamus* rhizome were toxic to the larvae as they caused blackening and death of larvae (Jadhav, 2009). However, in the present study, the aqueous leaf extract of *Epipremnum aureum* was not able to produce 50% larval mortality even after 96 hours when compared with these previous reports.

Natural products of plants come as an alternative, and ecologically more compatible in substitution to the synthetic insecticides. The use of plant material or crude plant extracts and essential oil as botanical insecticides for the protection of agriculture plants and related stored products from insect pests is as old as agriculture itself (El-Wakeil, 2013). Botanical pesticides are known to be secondary metabolites that are produced in the plants as defense mechanism against herbivore predators (Gonzalez-Coloma *et al*., 2013), and produce a large variety of secondary metabolites which has wide range of activity including pesticide activity. Literature indicate the importance of plants in the protection of grains by way of direct mixing of dried leaves, plant powders, solvent extracts, essential oils on grains during post-harvest storage (Rajapakse, 1996) due to the bioactive compounds present in them. *Epipremnum aureum*, in general possesses phytochemicals like alkaloids, flavonoids, saponins, tannins and triterpenoids (Mehta *et al*., 2013b), and alkaloids, flavonoids, glycosides, phenols, saponins, sterols, tannins and terpenoids are present in its aqueous leaf extract (Sonawane *et al*., 2011; Zehraw *et al*., 2022). The results of the present study revealed that the aqueous leaf extract of *Epipremnum aureum* exhibited significant ovicidal activity. The activity of phytoextracts and phytocompounds strongly depends on the solvent used as the range and dynamic of the toxicity of extracts may double with the use of certain solvents. The performance of an extract is due to the concentrations of active phytocompounds present in them, since it has been found that active principles dissolve in mid and high polar solvents than those of less polarity which was corroborated to the present study, as water is the most polar solvent.

Table 1: Effect of *Epipremnum aureum* leaf extract on the eggs of *Corcyra cephalonica.*

Age of eggs (in hours)	Concentration (%)					
	Control	1.0	2.0	5.0	10.0	15.0
24	0.80 ± 1.30^{a}	8.60 ± 1.14^{b}	9.80 ± 0.44^{b}	13.20 ± 1.48^{c}	13.80 ± 0.83^{c}	14.40 ± 0.89^{c}
48	0.20 ± 0.44^{a}	5.40 ± 1.14^{b}	7.60 ± 1.14^{bc}	9.40 ± 1.67^{c}	12.40 ± 0.89^{d}	13.80 ± 1.30^{d}
72	0.00 ± 0.00^{a}	4.00 ± 1.00^{b}	5.40 ± 1.51^{b}	5.60 ± 1.51^{b}	10.00 ± 1.22^{c}	12.60 ± 0.89^{d}

Values are mean±standard deviation of five replicates of five trials; Different superscript alphabets in rows indicate values significant than control at p<0.05 level by one way ANOVA followed by Tukey test performed; Similar superscript alphabets indicate no significant difference

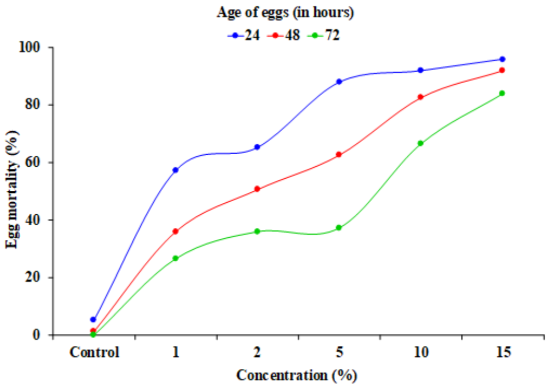

Fig. 1. Percent egg mortality of *Corcyra cephalonica* on exposure to *Epipremnum aureum* leaf extract.

Table 2: Effect of *Epipremnum aureum* leaf extract on the larvae of *Corcyra cephalonica.*

Exposure time (in hours)	Concentration (%)					
	Control	1.0	2.0	5.0	10.0	15.0
24	0.00 ± 0.00^{a}	0.00 ± 0.00^{a}	0.00 ± 0.00^{a}	0.00 ± 0.00^{a}	1.00 ± 1.00^{a}	3.60 ± 0.54^{a}
48	0.00 ± 0.00^{a}	0.00 ± 0.00^{a}	0.20 ± 0.44^{a}	0.60 ± 0.54^{ab}	2.00 ± 1.00^{ab}	4.60 ± 1.09^{c}
72	0.00 ± 0.00^{a}	0.20 ± 0.44^{a}	1.00 ± 0.70^{ab}	2.00 ± 0.70^{ab}	3.60 ± 0.89^{bc}	5.80 ± 0.70^{c}
96	0.40 ± 0.54^{a}	0.80 ± 0.83^{ab}	1.60 ± 0.89^{ab}	2.40 ± 1.14^{b}	5.20 ± 1.09^{c}	7.40 ± 1.14^{d}

Values are mean±standard deviation of five replicates of five trials; Different superscript alphabets in rows indicate values significant than control at p<0.05 level by one way ANOVA followed by Tukey test performed; Similar superscript alphabets indicate no significant difference

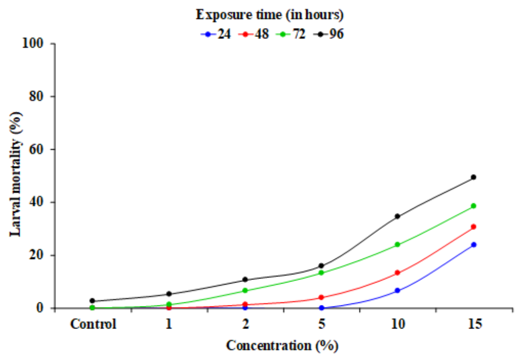

Fig. 2. Percent larval mortality of *Corcyra cephalonica* on exposure to *Epipremnum aureum* leaf extract.

Table 3: Statistical inference of *Epipremnum aureum* leaf extract against *Corcyra cephalonica* eggs and larvae.

Parameters	LC_{50} (%)	LC_{90} (%)	Intercept±S.E.	Slope±S.E.	χ^2	Regression equation	R^2	F value
Ovicidal								
24	0.81	7.27	1.350±0.193	0.118±0.120	15.76^{*}	Y= 6.458+0.662x	0.748	35.482^{*}
48	2.03	17.64	1.367±0.169	-0.422±0.118	15.72^{*}	Y= 4.006+0.750x	0.870	87.163^{*}
72	4.28	47.14	1.231±0.162	-0.778±0.123	21.87^{*}	Y= 2.304+0.720x	0.922	158.436^{*}
Larvicidal								
24	42.67	127.24	2.701±1.063	-4.403±1.125	8.66^{*}	Y= -0.164+0.103x	0.775	$42.125^{\dagger}$
48	63.88	437.14	1.534±0.384	-2.770±0.379	13.09^{*}	Y= -0.083+0.167x	0.816	$55.171^{\dagger}$
72	43.57	510.47	1.199±0.232	-1.966±0.210	8.84^{*}	Y= 0.253+0.281x	0.910	$135.606^{\dagger}$
96	18.53	161.69	1.362±0.199	-1.728±0.175	14.48^{*}	Y= 0.396+0.467x	0.943	$226.596^{\dagger}$

LC_{50} & LC_{90}: Lethal concentration that kills 50% and 90% of the exposed egg/larvae; χ^2: Chi-square value; R^2: Coefficient of determination; *Values significant at $p\leq0.05$ level; †Values not significant at $p\leq0.05$ level

CONCLUSIONS

Though the present study being the first report exposed *Epipremnum aureum* aqueous leaf extracts to exhibit significant ovicidal activity, but at the same time, it is to be noted that they showed poor larvicidal activity.

FUTURE SCOPE

Stored grain pests may be differentially susceptible to active substances delivered in various solvents. Therefore, the need for a wide range of solvents, with different parts of *Epipremnum aureum* be tested against

Corcyra cephalonica eggs in particular, and against the larvae and adults in general for its insecticidal activity.

Conflict of Interest. None

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