

## THE OCCURRENCE OF *AGRIPHILA TRISTELLA* ([DENIS & SCHIFFERMÜLLER], 1775) IN KARACHI, PAKISTAN

D. Khan<sup>1</sup>, S. Viqar Ali<sup>2</sup>, Saeeda Nargis Viqar<sup>3</sup> and Imtiaz Ahmad<sup>4</sup>

<sup>1</sup>Department of Botany, University of Karachi, Karachi, Pakistan

<sup>2</sup> Secretariat, Ministry of Environment and Climate Change, Govt. of Sindh, Korangi Industrial Area, Karachi.

<sup>3</sup>Govt. Girls Degree College, Block M, North Nazimabad, Karachi

<sup>4</sup>Biological Research Centre, University of Karachi, Karachi, Pakistan.

---

### ABSTRACT

*Agriphila tristella* ([Denis and Schiffermüller], 1775), a stick moth (Family Crambidae: Lepidoptera), was collected accidentally from Karachi in the night of July 16, 2012. It is brown in colour. Eyes are large. Antennae are with alternating brown and white bands. Labial palpi pored. Wing span of this insect is c 20 mm. Fore wing is nearly 1.5 times larger than the main body of the moth. Forewing elongated. Terminal line is not perpendicular to costa. Hind wing is broad. Papilla anales large, broad rectangular in shape beset with setae. Corpus bursae balloon like without cornuti. It appears to be a new record for the moth species of Pakistan.

**Key Words:** *Agriphila tristella* (Denis and Schiffermüller, 1775), Stick Moth, Lepidoptera, Pakistan Insect Fauna

---

### INTRODUCTION

The Order Lepidoptera (Gr. lepis = scales and pteron = wings) includes about 1,80,000 known species with an enormous number still to be found and be described (Kamaluddin *et al.*, 2007). Chaudhry *et al.* (1966 and 1970) presented the results of their survey of insect fauna of forests of Pakistan and Haque (1970) published a handbook on agricultural pests in Pakistan. Hashmi and Tashfeen (1992) published the Lepidoptera of Pakistan. Besides several checklists published for insect fauna of British India (Butler, 1875; Cotes and Swinhoe, 1886, 1889; Hampson, 1892-1898; Lefroy, 1909; Savatopolo, 1940, 1942 & 1947), Mathew's checklist of moths of India published in 2006 and that of Kamaluddin *et al.* (2007) of moths of Pakistan are the latest. Kamaluddin *et al.* (2007) presented a list of 240 moth species in their checklist with 33 pyralids inclusive the members of subfamily Crambinae which has been raised to a level of Family Crambidae under the group of superfamily Pyreloidea. No record of genus *Agriphila*, *Tinea* and *Crambus* is available in this check list.

In this paper, we report the presence of *Agriphila tristella* (Denis and Schiffermüller, 1775) from Karachi.

### CLASSIFICATION

Kingdom: Animalia  
Phylum: Arthropoda  
S. Phylum: Hexapoda  
Class: Insecta  
Order: Lepidoptera  
Superfamily: Pyreloidea  
Family: Crambidae Latreille, 1810  
Sub-Family: Crambinae Latreille, 1810  
Genus: *Agriphila* Hübner, 1825  
Species: *Agriphila tristella* ([Denis and Schiffermüller], 1775)  
(*Tinea tristella* Denis and Schiffermüller, 1775; Ankündigung eines systematischen works vonden Schmetterlingen de wienergegend: 134. TL Austria, Wien Sur)

Mathew (2006) dealt *A. tristella* in Crambinae, as a subfamily of Family Pyralidae whereas several authors include this species in Family Crambidae. The subfamily Crambinae Latreille 1810 is represented by almost 2000 species in 174 genera and is distributed throughout the World. Of these species, 370 species (49 genera) have been reported from palaeartic region (Błeszyński, S. 1965). *Agriphila* is a genus of small moths. Despite the fact that the genus *Agriphila* was proposed quite early, it was not recognized until the mid of the 20<sup>th</sup> century. Consequently the most species were placed in genus *Crambus* (Sevela, 2005). Błeszyński, H. split genus *Crambus* in 1963.

### Synonymy

*Tinea ferruginella* Thunberg, 1788; Mus. Nat. Acad. Upsal. 6:78.

*Tinea paleella* Hübner, 1796; Samml. Eur. Schmett.[8] 24: 8, f.51, TL: Germany, Ausberg.

*T. aquiella* Hübner, 1796; Samml. Eur. Schmett.[8] 24: 8, f.52, TL: Germany, Ausberg.

*T. fuscinea* Schrank, 1802; Fauna Boica 2(2): 100, TL: Germany, Bayem.

*Crambus moerens* Fabricius 1798; Ent. Syst. (Suppl.): 473, TL: Austria.

*C. fuscenellus* Stephens, 1834; III. Br. Ent. (Haustellata) 4 (2): 329, TL: England.

*C. nigristriellus* Stephens, 1834; III. Br. Ent. (Haustellata) 4 (2): 330, TL: England

*C. discistrigatus* Hampson, 1919; Ann. Mag. Nat. Hist. (9) 3 (15): 282, TL: Punjab, Hundes.

*C. hertwigae* Rasmussen, 1964; Ent. Medd. 32: 3912, f 1-3, TL: Denmark.

*Agriphila tristella pseudotristella* Zerny, 1943; Z. Wine. Ent. Ges. 28: 138, pl. 9, f. 2-4, TL: Sicily, Mistrella.

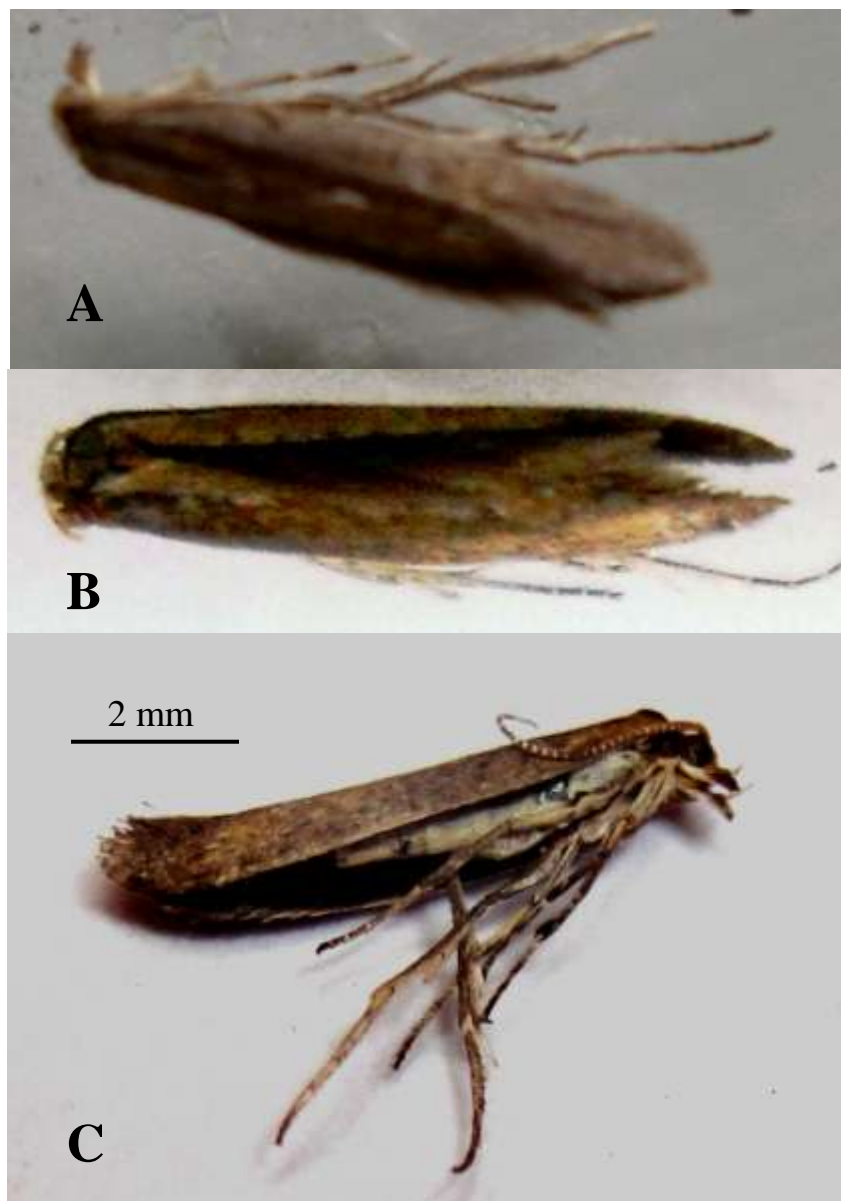


Figure 1. *Agriphila tristella* A. Lateral view to show the vein marking; B, Dorsal View; C, Latero-ventral view.

## COLLECTION

Two specimens – Both female – One collected from Islamabad in 2003 by S.V. Ali with light trap and one collected from Karachi by D. Khan accidentally from wash room in the night of July 16, 2012. The consultation of literature and its morphological studies led to the identification of this organism as *Agriphila tristella* (Denis and Schiffermüller, 1775), a “stick micromoth”, known as common Grass-Veneer in UK. The larvae feed in the base of stems of grass (Kimber, 2012). The publications of Kuchlein (1978), Goater (1986), Baker (1994), Berkshire Moth Group (2008; [www.berkshiremothgroup.co.uk](http://www.berkshiremothgroup.co.uk)) and British Lepidopera (2012; [britshlepidoptera.weebly.com](http://britshlepidoptera.weebly.com)) were the important references for comparison and identification.

## DISTRIBUTION

*Agriphila tristella* is reported from Europe and Western and Southern part of Asia. It flies from June to September depending upon the geographic location. It was collected from Cuskinny Marsh Nature Reserve by Bond (1994). Jansen (2005) has reported *A. tristella* from brackish salt marshes of Belgium associated with Graminae. Székely (2011) reported it from Romania (Bucharest and its surroundings). Earlier, Popeseu-Gorj (1964) reported it from Bucharest. It is known to occur in Turkey ([www.Wikipedia](http://www.Wikipedia)). Pastoralis (2010) reported it from Slovakia. It is reported from Estonia ([www.enotes.com/topic/list\\_of\\_moths\\_of\\_Estonia](http://www.enotes.com/topic/list_of_moths_of_Estonia)). It is reported from Croatia ([wikivisually.com/wiki/List\\_of\\_moths\\_of\\_Croatia](http://wikivisually.com/wiki/List_of_moths_of_Croatia)) Karsholt and van Nieuwerkerken (2001, Ed.) reported that it occurs all over Europe. It is a phytophagous insect and its larvae feed on various grasses. There is close association of *Agriphila* with Graminae (Emmet, 1979; Owen, 1991). *Deschampsia cespitosa* and *D. alpina* are the main plants attacked by this micromoth in British Isles ([www.ecoflora.co.uk/search\\_phytophagy2.php?](http://www.ecoflora.co.uk/search_phytophagy2.php?)). Its host (s) in Pakistan is not known. A great deal of work is needed to be undertaken in this part of the World to elucidate its biology. This moth was also recorded from bath room (18-8-87); in garden (19-8-87) and in Warren (20-8-87) as reported by Morgan, 1987) in his report – The Invertebrate Fauna of Gregynog, Montgomery. It has been reported from India (Methew, 2006). Recently, Roohigohar *et al.* (2016) have described Iranian species of the subfamily Crambinae. Based on a collection on a period of 70 years from various areas of Iran and preserved in Haykmirzayans Insect Museum Tehran, 64 species have been described, of which 9 species are described under the genus *Agriphila* Hübner (1825) including *Agriphila tristella* ([Devis & Schiffermüller], 1775) collected in the end of August to the early October between 50-1500m. In brief, this insect is known to be distributed in Asia Minor, C. Asia, Europe (including Austria- the type locality, Transcaucasia, W. Siberian plains, Iran, NW India (Błleszyński, 1965; Methew., 2006; Slamka, 2008); Roohigohar *et al.*, 2016) and now Pakistan.

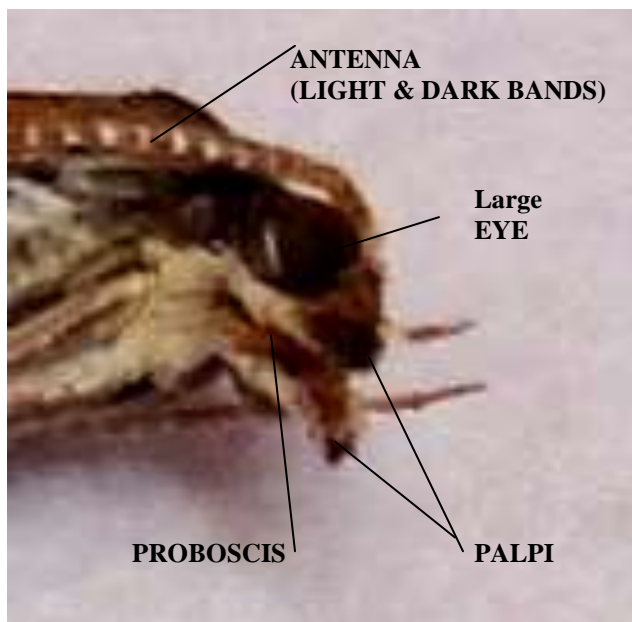


Fig. 2. Head region of *A. tristella*. A, captured specimen.

Various abiotic parameters that influence the insect migration and the effects of these parameters under changing climate scenarios have been discussed by Sujaynand and Karuppaith (2016). Recent climatic and atmospheric trends are affecting species physiology, distribution and phenology of Lepidoptera (Hughes, 2015). It

has been asserted that phenology and distribution of large number of microlepidoptera (including *A. tristella* and other *Agriphilas*) are being influenced with the climate change in Netherlands (Ellis *et al.*, 1997a and b; Kuchlein and Ellis (1997) and in Britain and Germany (Burton and Sparks, 2003). We know nothing about the effects of changing climate on local insect fauna in general and macro- and microlepidoptera in particular. There is a need to understand flight, phenological and distributional patterns of our insect life.

### MORPHOLOGICAL CHARACTERS

Body slightly less than 1 cm in length, stick like and brown in colour (Fig. 1). Wing span is around 20 mm. Wings completely cover the main body of the moth. The wing markings are faintly visible. According to Identification Guide of Berkshire Moth Group (2008, Editors - Asher *et al.*, 2008) the insect is, generally quite variable both in ground colour and strength of markings. Fore wings brown. Hind wings pale-grey brown. Wings are nearly 1.5 times larger than the body of the moth. Fore wings are elongated and rounded from the apex while hind wings are shorter than fore wings and broad. Antennae with alternating light and dark brown bands and antennal bases are purely olive-brown. The eyes are large. Porected labial palpi (Fig. 2). Termen not perpendicular to costa.

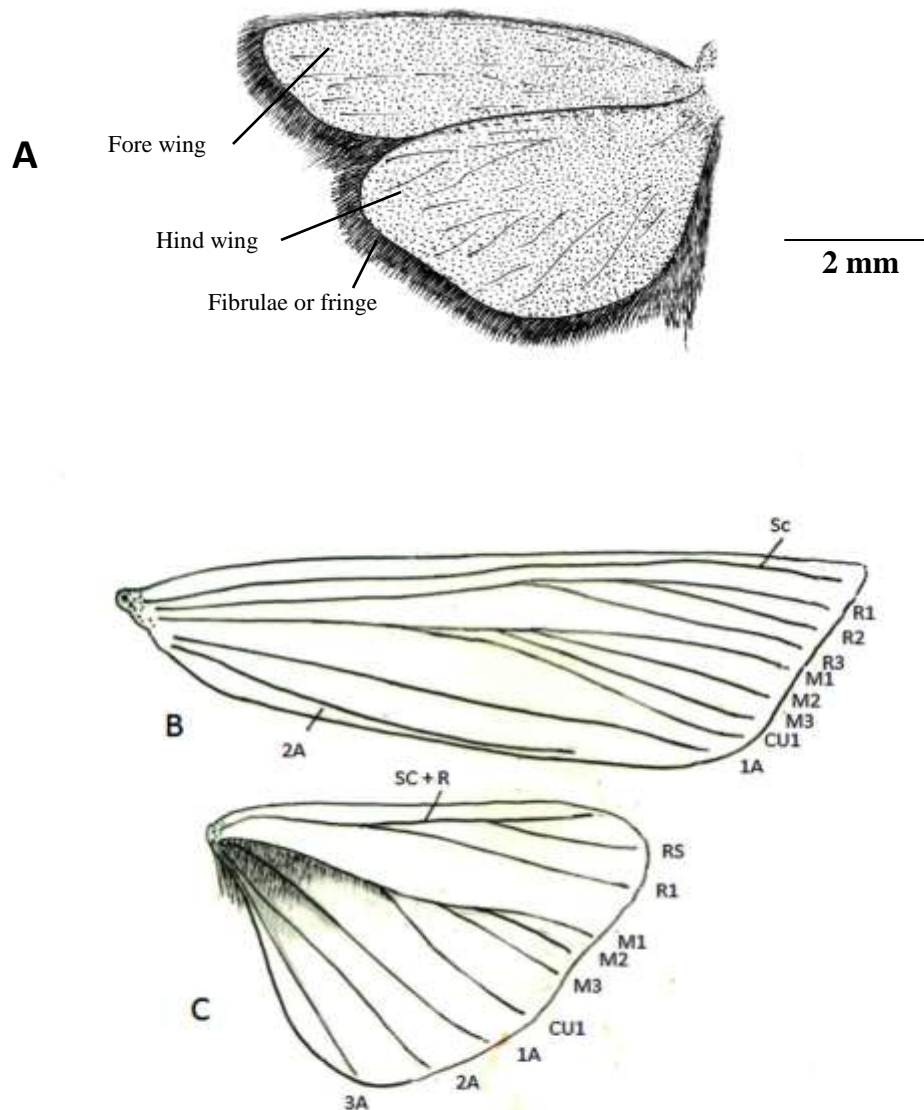


Fig. 3. Wings of *Agriphila tristella*. A, Fore and hind wings showing fibrulae; B, Fore wing neuration and C, Hind wing neuration.

### Fore Wing Venation

Forewing elongated, Vein SC present originating separately, R1 and R2 anastomizing then again anastomizing with R3 originating with upper portion of the wing. M1 and M2 anastomize and then again anastomize with M3. CU1 anastomizes with median. Two anal veins are present (1A and 2A) originating separately from basal part of the wing. Distal cell is absent (Fig.3).

### Hind Wing Venation

Hind wing broad, but smaller than fore wing. SC + R originate from upper apical portion of the wing and anastomizing with RS, then anastomizes with R1. Three median veins are present – M1 and M2 anastomizing and then quickly anastomizing with M3. One Cubitus (CU1) is present. Three anal veins (1A, 2A, and 3A) are present. No distal cell is present (Fig. 3)

### Female Genitalia

Papilla anales large, broad rectangular in shape beset with setae, apophysis posterior proximally twisted and broad, distally bifurcated about two time the length of apophysis anterior, later distally truncated, globus vaginallis short, triangular in shape, ductus bursae broad tubular divided into two parts bi-oblique demarcation, Corpus bursae balloon like without cornuti (Fig.4B).

### Comparative Note

Differentiated by fore wing narrow and elongated and Porected labial palpi and typical structure of female genitalia. *Agriphila tristella* may easily be confused with *Agriphila selasella*, which is known to have a long white streak nearly all along the wing very obvious when seen laterally. The antennae are not banded in *A. selasella*.

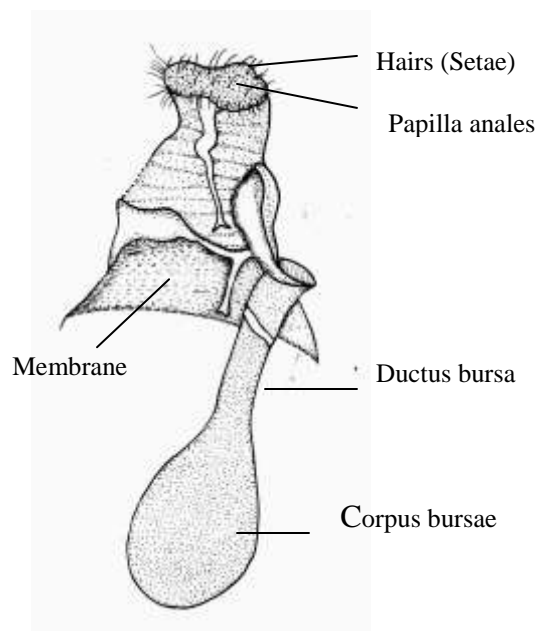


Fig.4. *A. tristella* : Female genitalia: as seen under magnification - 12X 10 X.

### REFERENCES

- Asher, N, M. Calway, R. Dobson, L. Fineh and G. Hawker (Editors) (2008). Identification Guide (1) Berkshire Moth Group (2008). The common grass moths of Berkshire moth (VC22). A guide to identification (pp 1-16). [www.berkshiremothgroup.co.uk](http://www.berkshiremothgroup.co.uk).
- Baker, B.R. (1994). *The Butterflies and Moths of Berkshire*. Heddera Press, Uffington, UK.
- Berkshire Moth group (2008). *Identification Guide 1*. The common grass moths of Berkshire VC22. [www.berkshiremothgroup.co.uk](http://www.berkshiremothgroup.co.uk)
- British Lepidoptera (2012). *Crambidae / Crambinae*. 1303 *Agriphila selasella* vs. 1305 *Agriphila tristella*. ([britishlepidoptera.weebly.com](http://britishlepidoptera.weebly.com)).
- Bleszyński, H. (1963). Studies on Crambidae (Lepidoptera), Pt. 40, A Review of the genera of Family Crambidae with data on their synonymy and types. *Acta Zool. Cracoviensia*, 8: 91-132.

- Błeszyński, S. (1965). Crambinae. In: H.G. Amsel, F. Gregor and H. Reisser (Eds.). *Microlepidoptera Palaearctica*, 1(1): 1-553 pp & 2:133pls. Georg Fomme & Co. Wein.
- Bond, K. (1994). *A survey of the Lepidoptera of Cuskinny, Great Island, Co cork* (1993-1994). www.cuskinynature resource.net/home.html). Dept. Zool. & Anim. Ecol. National University of Ireland at Cork.
- Burton, J, F, and T.H. Sparks (2003). The flight phenological responses of lepidoptera to climate change in Britain and Germany. *Atlanta* 34 (1/2): 3-16. Wurzburg. ISSN-0171-0079.
- Butler, R. (1875). Descriptions of several African and Australian Lepidoptera in the collection of the British Museum. *Ann. Mag. Nat. Hist.*, 19 (4): 458-462.
- Chaudhry, G.U., M.I. Chaudhry and S.M. Khan (1966). *Survey of Insect Fauna of Forests of Pakistan*. Final Technical Report Biol. Sci. Res. Div. 1: 167 pp.
- Chaudhry, G.U., M.I. Chaudhry and S.M. Khan (1970). *Survey of Insect Fauna of Forests of Pakistan*. Final Technical Report Biol. Sci. Res. Div. 2: 169 pp.
- Cotes, E.C. and C.C. Swinhoe (1886-1889). *A Catalogue of the Moths of India*. Sphinges 1. Calcutta. 810 pp.
- Ellis, W.N., J.H. Donner and J.H. Kuchlein (1997a). Recent shift in phenology of microlepidoptera related to climatic change (Lepidoptera). *Entomologische Berichten Amsterdam*, 57: 66-72.
- Ellis, W.N., J.H. Donner and J.H. Kuchlein (1997b). Recent shifts in distribution of microlepidoptera in the Netherlands. *Entomologische Berichten Amsterdam*, 57: 119-125..
- Emmet, A.M. (1979). *A Field Guide to Smaller British Lepidoptera*. 1-271: 196. (www.brc.ac.uk/dbif/sources results.aspx? sourceid=7079)
- Goater, B. (1986). *British Pyralids Moths*. Harley Books, Colchester, UK.
- Hampson, G.F. (1892-1898). *The Fauna of British India including Ceylon and Burma*. Faun. Brit. Ind. I. Frances and Taylor, pp 490.
- Haque, H. (1970). *Handbook of Agricultural Pests of Pakistan and Their Control*. Govt. Pakistan. Ministry of Agricult. & Works. Dept. Pl. Protection. 125 Pp.
- Hashmi, A.A. and A. Tashfeen (1992). Lepidoptera of Pakistan. *Proc. Pakistan Conf. Zool.* 12: 171-206.
- Jansen, M.G.M. (2005). The Lepidoptera Fauna of three brackish salt marshes including two new species new for Belgium fauna (Lepidoptera). *Phegea* 33 (2): I.VI. 2005: 59-68.
- Kamaluddin, S., S. Nargis Viqar, K.A.B. Saeed Khan and A. Ali. (2007). Check list of Moths (Lepidoptera: Heterocera) of Pakistan. *Intern. J. Biol. & Biotech.*, 4 (2): 113-119.
- Karsholt, O. and E.J. Van Nieukerken (Eds. 2009). Lepidoptera moths. *Fauna Europaea*. Version 2.1 ([http://www. faunaeur.org](http://www.faunaeur.org). visited July, 2012).
- Kimber, I. (2012). *UK moths* (ukmoths.org.uk/show. php?bf=1305).
- Kuchlein, J.H. (1978). Synopsis of NW European microlepidoptera with special reference to the ecology and taxonomy of the Dutch species. (Mededling EIS-Nederland, no. 1). Part 1. Introduction and Pyralidae (Galleriinae). *Zoologische Bijdragen* 24: 3-53.
- Kuchlein, J.H. and W.N. Ellis (1997). Climate induced change in microlepidoptera fauna of the Netherlands and the implication for Nature conservation. *J. Insect Conservation*, 1: 73-80.
- Lefroy, H.M. (1909). *Indian Insects Life*. W. Thanckers and Co. London. Pp. 786.
- Methew, G. (2006). An inventory of Indian Pyralids (Lepidoptera: Pyraloidea). *Zoos' Print Journal* 21 (5): 2245-2258.
- Morgan, M.J. (1987). *The invertebrate Fauna of Gregynog, Montgomery* (SO 09, VC47). Natural Sci. Rep. 96/5/1.
- Owen, J. (1991). *The Ecology of Garden: The First Fifteen Years*. Cambridge University Press. 415 pp.
- Pastoralis, G. (2010). A checklist of microlepidoptera occurred in Slovakia (Lepidoptera: microlepidoptera) *Folia Faunistica Slovacea* 15(9): 61-93.
- Popeseu-Gorj, A. (1964). *Catalogue de la collection de lepidopteres*. "Prof. A. Ostrovich" du museum d' Histoire Naturelle, Grigore Antipa Bucharest. 320 pp.
- Roohigohar, S, H. Alipanah and I. Sohrab (2016). Crambinae of Iran (Lepidoptera; Pyraloidea, Crambidae. *SILAP Revta. Lepid.* 44(175): 473-518.
- Savastopolo, D.G. (1940, 1942 and 1947). The early stages of Indian Lepidoptera. *J. Bombay Nat. Hist. Soc.* 61 (1-2): 33-320.
- Sevela, M. (2005). *Markku Sevela's Lepidoptera and Some other Life Forms*. Swinhoe, C.C. and E.C. Cotes (1889). *A Catalogue of the Moths of India* 4: 694.
- Slamka, F. (2008). *Pyraloidea of Europe: Crambinae & Schoenobiinae*. 2: 223 Pp. Frantisek. Slamka Ed., Bratislava.
- Sujayanand, G.K. and V. Karuppait (2016). Aftermath of climate change on insect migration: A Review. *Agricultural Reviews* Vol. 33 (3): 221-227.
- Székely, L. (2011). *The Lepidoptera of Bucharest and its surroundings* (Romania). Travaux du Museum National d' Histoire Naturelle. Grigore Antipa. Vol. LIV (2): 461-512.

(Accepted for publication November, 2016)