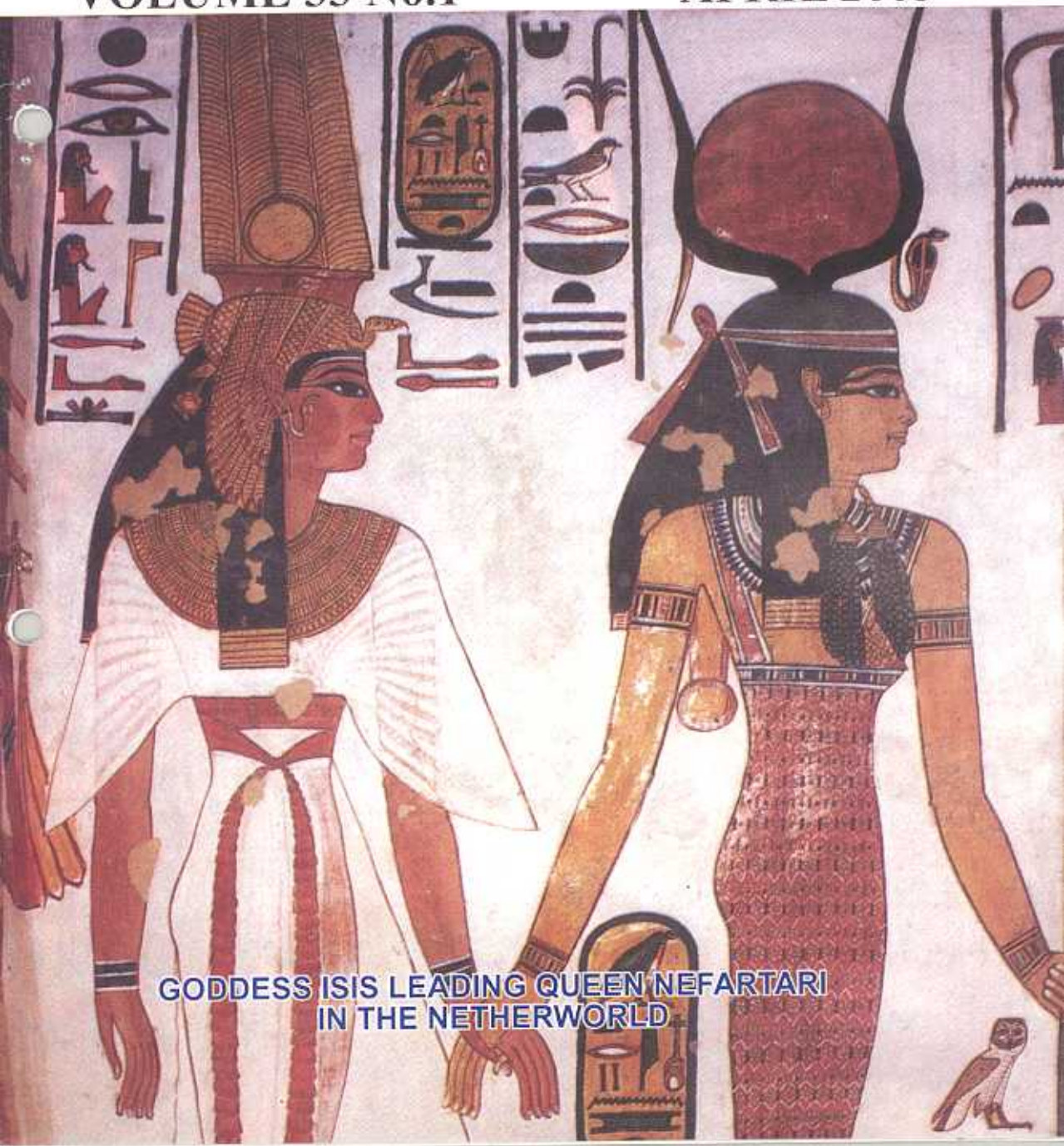
ISSN: 1110 - 0583

JOURNAL OF THE EGYPTIAN SOCIETY OF PARASITOLOGY

VOLUME 33 No.1 APRIL 2003



GODDESS ISIS LEADING QUEEN NEFARTARI
IN THE NETHERWORLD

Journal of the Egyptian Society of Parasitology, Vol. 33, No. 1, April 2003

J. Egypt. Soc. Parasitol., 33 (1), 2003: 1 - 12

NEW RECORD OF CLUSTER FLY *POLLENIA RUDIS* (FABRICIUS) WITH DISTRIBUTION OF ALL KNOWN BLOW FLIES (DIPTERA: CALLIPHORIDAE) OF SAUDI ARABIA

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Abstract

During a survey of dipterous flies from Riyadh province, a newly recorded of the cluster fly *Pollenia rudis* (Fabricius) (Diptera: Calliphoridae) were collected from Saudi Arabia for the first time. A total of 2 males and 3 females were collected from Wadi Haniffa, Riyadh City during the period from February to March 1999 using an aerial net. Data on the morphology, veterinary importance, biology and geographical distribution are presented. Blow-flies lift up to 17 taxa known from the country. A summary of the zoogeographical check up to the 17 species, is presented with widespread distribution for each species.

Introduction

Adult cluster flies, *Pollenia rudis* (Fabricius) have long been familiar to entomologists in Europe, Asia and North America (Delfinado and Hardy, 1977; Stone *et al.*, 1983). Flies are dark gray to black and a little larger than house flies, with short crinkly golden hairs on the thorax and their wings overlap over the abdomen when at rest (Hall, 1948). Cluster flies are named for their habit of over-wintering in large cluster within the atties or upper walls of homes and buildings (Robineau- Desvoidy,

1863; Dall, 1882). Hibernating adults of the cluster fly are an annual problem in many houses in varies areas of North America (Hall, 1948; Allan, 1967). The larval stage of these species has been reported as a parasite of the following species of earthworms: *Eisenia rosea* (Sav.), *Allolobophora chlorotica* (Sav.), *A. caliginosa* (Sav.) and *Lumbricus terrestris* (Linnaeus) (Keilin, 1915; Webb and Hutchison, 1916; DeCoursey, 1927; Pimentel and Epstein, 1960). The life cycle is very dependent on weather conditions, in Europe described by Keilin (1915) and Barnes (1924), whereas in North America described by Webb and Hutchison (1916), DeCoursey (1927), Pimental and Epstein (1960) and Yahnke and George (1972). The life cycle from egg to adult stage takes from 25- 30 days at 23°C (Yahnke and George, 1972). The eggs are laid singly in soil cracks near to earthworms, they hatched three days after oviposition and the first instar larvae seek out the earthworms. The larvae enter at almost any point along the earthworm's body and begin to feed. The feeding lasts 11- 14 days. The fully- grown larvae then leave their hosts and pupate in the soil. Pupation lasts 11-14 days. DeCoursey (1927) concluded that there were four generations per year in the latitude of Washington. The record of *P. rudis* lift up to 17 the taxa known in the country. Herein we report the distribution of the cluster fly in Riyadh province. A summary of the zoogeographical check up to the 17 species, is presented with the widespread distribution for each species. All distributions mentioned in this article are taken from the checklist of *P. rudis* as indicated in the text with all references. This paper aimed to provide the total numbers of all known Calliphorid flies and their distribution in Saudi Arabia.

Materials and Methods

Study area: Riyadh province is 430 to 600m above sea level with a mean precipitation of 146.3mm, which falls in winter and spring. The mean daily air temperature ranges from 7.3 to 22.0°C in winter and 24.3 to 44.9°C in summer and the mean daily relative humidity ranges from 17% to 50%(Data obtained from Hydrology Division, Ministry of Agriculture and Water, Riyadh). Riyadh province is one of the richest agricultural

districts of the Kingdom. The farms are irrigated by water pumped from wells and are extensively planted with wheat, vegetables, fruit, and date palms. The scarce natural vegetation consists of herbs *Citrullus colocynthis*, and *Blepharis ciliaris*, shrubs *Hammada elegans* and *Rhazya stricta*, and trees *Calotropis procera* and *Acacia* spp. A full list of the natural vegetation of the study area is given by Migahid (1978).

The survey was undertaken Wadi Haniffa, Riyadh province during the period from February to March 1999. A total adults 2 males and 3 females were collected by aerial net from fruit and vegetable farms. The flies were mounted and identified. Identification of specimens was kindly determined by Dr. Azza Abd El-Halim of Egypt. Geographical localities of all known blow flies within Saudi Arabia follow a North-West to South-East sequence of provinces listed (Figs 1, 2, 3).

Results and Discussion

The checklist of members of order Calliphoridae in Saudi Arabia includes about seventeen species.

1 - *Bengalia minor* Malloch: Locality: Saudi Arabia: Gizan, April-May (Abu- Thuray, 1982).

2 - *Calliphora vicina* Robineau- Desvoidy, 1830: Locality: Saudi Arabia: 1♀, 18.2.1976; 1♀, 15.3.1976, Riyadh and 1♀, 2.3, 1976, Safwa (Buttiker *et al.*, 1979). Distribution: Saudi Arabia, Africa (Egypt, South Africa), Asia (China, India, Nepal, Pakistan), Europe, North and South America (Alaska, Canada, Mexico, U.S.A.), Australia, New Zealand (Buttiker *et al.*, 1979; Stone *et al.*, 1983; Morsy *et al.*, 1991).

3 - *Chrysomya albiceps* (Wiedemann, 1819): Locality: Saudi Arabia: Widespread in all regions (Buttiker et al., 1979). 15♂, 25♀, Dammam, 29.2.1990; 2♂, 3♀, Abha, 7.8.1984; 1♂, Riyadh, 23.3.1971; 5♂, 2♀, Al-Kharj, 6.4.1967; Several specimens, Riyadh, 1.11.1991, 21.11.1998, in the collection of the Zoology Department, King Saud University. Distribution: Saudi Arabia, Africa (Egypt, South Africa), Asia (India, Oman, Pakistan), Europe, South America (Argentina, Brazil, Paraguay, Peru, Uruguay) (Fain *et al.*, 1959; Zumpt, 1965; Delfinado and

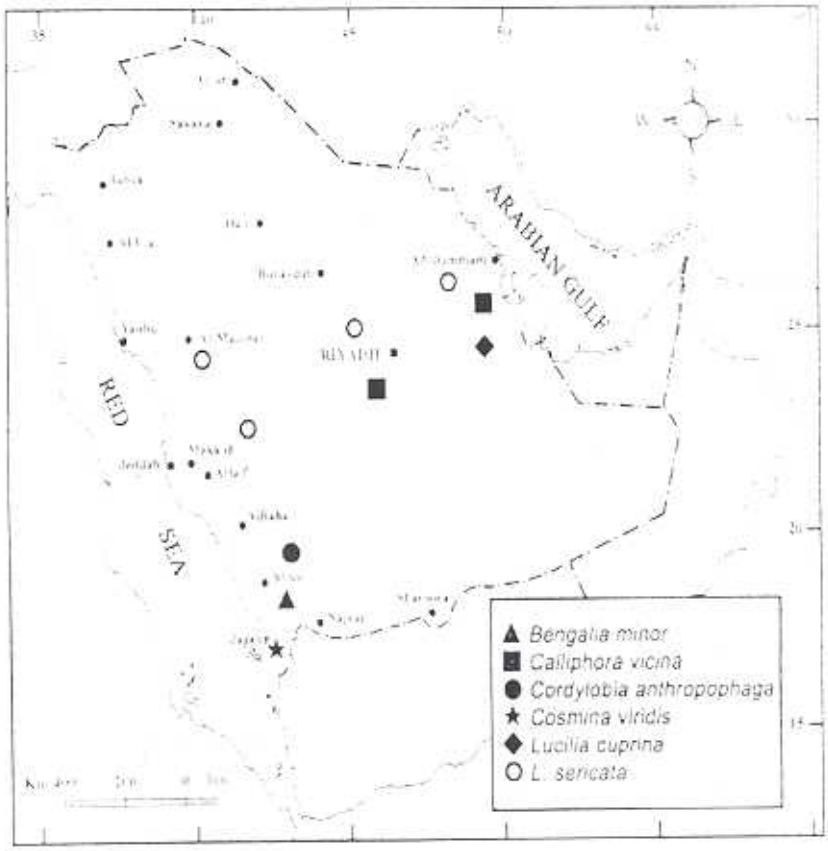

Fig. 1: Distribution of *Bengalia minor*, *Calliphora vicina*, *Cordylobia anthropophaga*, *Cosmina viridis*, *Lucilia cuprina* and *L. sericata* in Saudi Arabia.

Hardy, 1977; Erzincliogiu and Whitcombe, 1983; Baumgartner and Greenberg, 1985; Morsy *et al.*, 1991).

4 - *Chrysomya bezziana* (Villeneuve, 1914): Locality: Saudi Arabia: a single myiasis case (Ansari and Oertley, 1982). Twelve cases of myiasis in sheep by larvae, reared to adults. Riyadh region, 17.3. 1998, 1.3. 1999, 3.3. 1999, 17.2. 2000 (Alahmed, 2002). Distribution: Saudi Arabia, Africa, Asia (Bahrian, Ceylon, Emirates, India, Kuwait, Malaya, Oman, Philippines, Qatar) (Norris and Murray, 1964; Delfinado and Hardy, 1977; Kloft *et al.*, 1981; Ansari and Oertley, 1982; Rajapaska and Spradberry, 1989; Spradbery and Kirk, 1992; Deeming, 1996; Alahmed, 2002).

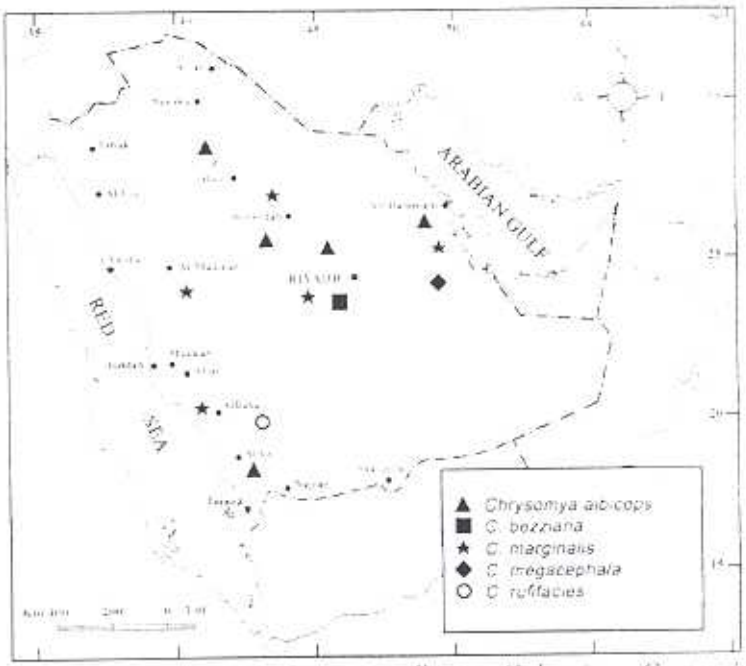

Fig. 2: Distribution of *Chrysomya albiceps*, *C. bezziana*, *C. marginalis*, *C. megacephala* and *C. rufifacies* in Saudi Arabia.

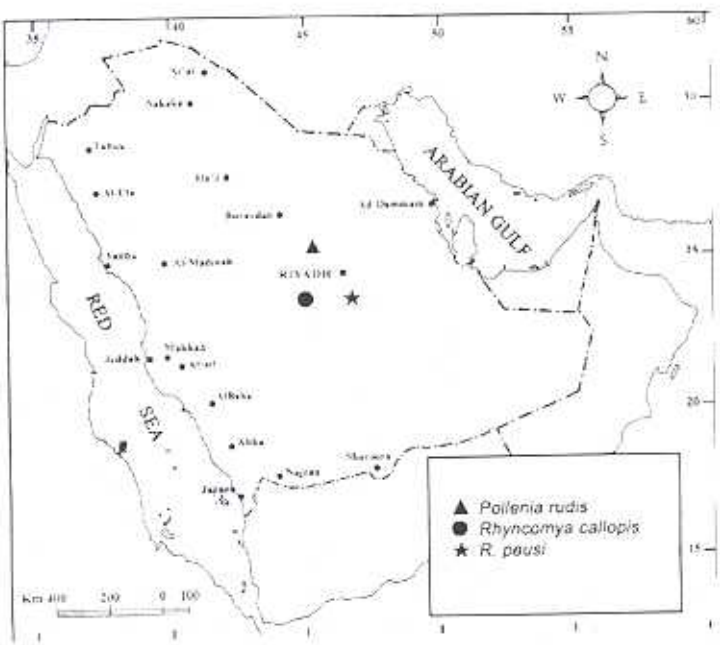

Fig. 3: Distribution of *Pollenia rudis*, *Rhyncomya callopis* and *R. pausi* in Saudi Arabia.

5 - *Chrysomya chloropyga putoria* (Wiedemann, 1818): Locality: Saudi Arabia: Found on garbage dumps, garden and slaughterhouses (Buttiker *et al.*, 1979).
Distribution: Saudi Arabia, Africa (Egypt, Nigeria, South Africa, Tanzania, Zaier), Asia (Guinea, Yemen), South America (Argentina, Bolivia, Brazil, Colombia, Paraguay, Peru, Uruguay) (Zumpt, 1965; Buttiker *et al.*, 1979; Otesile and Dipeolu, 1981; Baumgartner and Greenberg, 1985).

6 - *Chrysomya marginalis* (Wiedemann, 1830): Locality: Saudi Arabia: Western, Eastern and Central regions, 41♀, 39♂, Wadi Mutawiyah, 18.3.1977 (Buttiker et al., 1979), 1♂, 6♀, Riyadh, 9.10.1991; 1♂, 2♀, Al- Kharj, 9.5.1979; 3♂, Al- Baha, 1.7.1979; 1♂, 1♀, Al- Zulphi, 12.4.1980; 1♂, 1♀, Unayzah, 2.11.1984; 1♂, 4♀, Khamis Mushait, 7.2.1983; Several specimens, Riyadh, 21.11.1998, in the collection of the Zoology Department, King Saud University. Distribution: Saudi Arabia, Africa (Afrotropical region, Egypt, Kenya, South Africa), Asia (Oriental region, Pakistan, Syria) (Delfinado and Hardy, 1977; Buttiker *et al.*, 1979; Pont, 1980; Morsy *et al.*, 1991).

7 - *Chrysomya megacephala* (Fabricius, 1794): Locality: Saudi Arabia: Cases of dermal myiasis in farm animals in Hofuf area (Eastern Province) (Ramadan and El- Bihari, 1980).
Distribution: Saudi Arabia, Africa (South Africa), Asia (Bengal, China, India, Guinea, Guan, Java, Oman), Australia, South America (Brazil), New Zealand, Hawai (Delfinado and Hardy, 1977; Pont, 1980; Ramadan and El- Bihari, 1980; Goff and Odom, 1987; Deeming, 1996).

8 - *Chrysomya rufifacies* (Macquart, 1843): Locality: Saudi Arabia: 1♀, Abha, 7.8.1984, in the collection of the Zoology Department, King Saud University.
Distribution: Saudi Arabia, Asia (India, Java), North America (U.S. A.), Australia, New Zealand, Hawai (Delfinado and Hardy, 1977; Gagne *et al.*, 1982; Goff and Odom, 1987; Amoudi, 1997).

9 - *Cordylobia anthropophaga* (Blanchard, 1893): Locality: Saudi Arabia: Several cases of myiasis in man caused by larvae, Abha, August- September 1979, khamis Mushayt, Asir Province, 15.10.1979 (Buttiker *et al.*, 1980). Distribution: Saudi Arabia, Africa (South of the Sahara including Nigeria, Sierra

Leone) (Blacklock and Thompson, 1923; Buttiker *et al.*, 1980; Edungbola, 1982).

10 - *Cosmina viridis* (Townsend, 1917): Locality: Saudi Arabia: Gizan, April-May (Abu- Thuray, 1982). Distribution: Saudi Arabia, Africa (Egypt, Ethiopia, French, Equatorial Africa), Asia (India, Iran, Nepal, Oman, Yemen) (Delfinado and Hardy, 1977; Abu- Thuray, 1982; Deeming, 1996).

11 - *Lucilia* (=*Phaenicia*) *cuprina* (Wiedemann, 1830): Locality: Saudi Arabia: 1♀ Eastern region (Buttiker *et al.*, 1979). Distribution: Saudi Arabia, Africa (Afrotropical region, Egypt), Asia (India, China, Kuwait, Laos, Pakistan, Philippines), South America (Argentina, Peru, Uruguay), Australia, Hawaii (James, 1970; Delfinado and Hardy, 1977; Buttiker *et al.*, 1979; Baumgartner and Greenberg, 1985; Morsy *et al.*, 1991).

12 - *Lucilia* (=*Phaenicia*) *sericata* (Meigen, 1826): Locality: Saudi Arabia: Widely distributed in the Western, Eastern and Central regions (Buttiker et al., 1979), Several cases of myiasis in sheep by larvae, some reared to adults, Riyadh, 15.5.1979, Wadi Qatan, 8.6.1979 (Buttiker and Zumpt, 1982); Several specimens are in the collection of the Researh Laboratory, Ministry of Agriculture and Water, Riyadh. Distribution: Saudi Arabia, Africa (Egypt, South Africa), Asia (Ceylon, India, Pakistan), Europe (England, Yogoslavia), South America (Argentina, Brazil, Peru), North America (Canada, Mexico, U.S.A.), Australia, New Zealand (Hall, 1948; Nikolio, 1952; Delfinado and Hardy, 1977; Buttiker *et al.*, 1979; Stone *et al.*, 1983; Baumgartner and Greenberg, 1985; Morsy and Mazyad, 2000).

13 - *Pollenia rudis* (Fabricius, 1794) New record to Saudi Arabia. Locality: Saudi Arabia: 2♂, 3 ♀, Wadi Haniffa, Riyadh Province, 1.3.1999. Distribution: Saudi Arabia, North Africa, Asia (India, Nepal), Europe (France, Germany, U.K.), North America (Canada, U.S.A.) (Keilin, 1915; Barnes, 1924; Delfinado and Hardy, 1977; Stone *et al.*, 1983).

14 - *Rhyncomya callopis* (Loew, 1856): Locality: Saudi Arabia: 1♂, Wadi Mizail, 13.6. 977, in the collection of the Natural History Museum, London, U.K. (Deeming, 1996). Distribution: Saudi Arabia, Africa (Algeria, Egypt, Moroco, Tunisia), Asia (Iran, Palestine, Turkmenia) (Deeming, 1996).

15 - *Rhyncomya flavipes* (Seguy, 1933)

Distribution: Saudi Arabia, Africa (Algeria, Chad, Egypt, Lidya, Mauritania, Niger, Riode Oro, Tunisia), Asia (Oman, Palestine) (Deeming, 1996).

16 - *Rhyncomya peusi* (Zumpt, 1956): Locality: Saudi Arabia: 1♂, Kushm al Buwaybiyat, 26.5.1978, in the collection of the Natural History Museum, London (Deeming, 1996). Distribution: Saudi Arabia, Europe (Albania, Black Sea region, Crete, Cyprus, Greek Islands, Romania, Turkey) (Deeming, 1996).

17 - *Villeneuviella seguyi* Grunin, 1957

Distribution: Saudi Arabia, Asia (Iran, Oman, Yemen) (Deeming, 1996).

Generally speaking, myiasis is a real zoonotic problem of Medical and Veterinary importance and more than 213 species of myiasis producing larvae are recorded in the world literature (Morsy *et al.*, 1999). Myiasis in the livestock causes great economic losses. In man, clinical myiasis ranges between the mild annoyance (furuncular myiasis) to severely disfiguring or fatal. Fatalities although rare, but usually result from central nervous system invasion or by the secondary bacterial infection caused by the pathogenic microorganisms carried with the invading larvae (Musa *et al.*, 1989). Besides, some myiasis producing larvae move from the site of entry to another site within human body causing migratory swellings that are red, painful accompanied by systemic symptoms as fever, myalgias and lymphadenopathy (Passos *et al.*, 1998). So, great attention must be paid to the Saudi Arabian Fauna of the myiasis producing larvae as well as friendly environmental control measure is a must

Acknowledgments

The author expresses his great appreciation to Dr. Azza Abd El- Halim, Egypt for confirming the identification of different species, appreciation is also extended to Mr. Salah Salem M. Abou-Fannah and to Dr. Fathi Diab, Egypt for their valuable comments.

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