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## Research Note

# First report of maggots of family Piophilidae recovered from human cadavers in Malaysia

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**Abstract.** *Piophila casei* (Linnaeus) (Diptera: Piophilidae) is reported from human cadavers in two separate forensic cases for the first time in Malaysia. Both bodies were found indoors. The first case, was that of a male of unknown nationality and age and also contained maggots of the muscid *Ophyra spinigera* (Stein). The second case was a female Chinese whose body also contained other species of maggots but these were not identifiable.

Medicolegal forensic entomology includes arthropod involvement in events such as murder, suicide, rape, physical abuse and contraband trafficking. In murder investigations, it deals with what insects lay eggs, when and where, and in what order they appear in dead bodies. This can be helpful in determining the time of death or post mortem interval (PMI). Insects will visit the body in question at different periods of body decomposition. Reid (1953) in Malaysia, summarized the first forensic entomology case of Nevin (1950) in Penang, found *Chrysomya megacephala* (Fabricius) larvae in a dead woman. Baharudin *et al.* (1994) found maggots of *Synthesiomyia nudiseta* (Wulp.) in decomposing cadaver of human found indoors. Lee (1996) reported that the most dominant species found on human cadavers were those of Calliphoridae and Sarcophagidae. He also mentioned that these species were at times found as a single species in a mass and at other times they are found together with other fly species. Nor Afandy *et al.* (2003) recovered 9 species of sarcosaprophagous flies in their forensic maggot specimens received from pathology departments. In a review of 538 forensic specimens recovered from 1972 till 2002, Lee *et al.* (2004) identified *Chrysomya* sp., *Sarcophaga* sp. *Lucilia* sp., *Hermetia* sp., *Hemipyrellia* sp., *Ophyra* sp., *Calliphora* sp., *Synthesiomyia nudiseta* and *Eristalis* sp.

In this paper, *Piophila casei* of the Family Piophilidae was recovered for the first time from two cases of pathological specimens received from Forensic Department of Kuala Lumpur Hospital. The maggots received from the pathologists were processed by standard procedures as described by Lee *et al.* (1984) and examined under a compound microscope. The first case was of a male of unknown nationality and age and was found dead inside a room in an abandoned house. He had multiple

blunt head injuries. The second case was a Chinese women found dead at home lying on a bed. The body was at the moderate decomposing stage and the skin was peeling off the body.

The family Piophilidae consists of one genus with 50 species and *Piophila casei* is a fly of known medical importance (Zumpt, 1965). *Piophila casei* or more commonly know as the 'cheese fly' or 'cheese skipper' are found in a variety of habitats that may include carrion, human waste, bones, skin and fur. They are commonly found in many parts of the world and are usually associated with protein rich food sources that are dry in nature (Byrd & Castner, 2001). The maggots are about 4-10 mm in length (Bohart & Gressitt, 1951; Zumpt, 1965; Smith, 1986) As the name indicates the larvae have the ability to jump. The first and second instar larvae are transparent and very difficult to locate (Smith, 1986). The maggots (Figure 1) were identified based on the taxonomic features described by Zumpt (1965) and Smith (1986). The maggot's body is composed of the usual twelve segments and is of typical muscoid shape. The cephaloskeleton is robust and provided with strong labial sclerites. The anterior spiracles are provided with 9-10 branches. The last segment is broad and shows a tube-like, slightly retractable terminal part which is provided with a pair of long fleshy processes. Between these, two mammillated ones are situated which bear the three-slitted peritremes. The ventral side of the body is provided with posteriorly directed denticles arranged in triple rows on each segment except the last one, which shows few teeth. The characteristic feature of the third instar maggots of *P. casei* is its ability to skip. Sukontason *et al.* (2001) has used electron microscope and described the features of the anterior cephalic region and creeping welts that are used in larval skipping and creeping. The greatest length of one leap is 23 cm while the greatest height is 20 cm. This skipping ability is most pronounced in the mature larvae which enables them to find a safe place for pupation (Simmons, 1927).

It has been described that the larvae do not take up residence in a corpse until three to six months after death when fatty acids and caseic products are present (Smith, 1986) and piophilids have even been recorded from Egyptian mummies (Cockburn *et al.*, 1975). Byrd & Castner (2001) mentioned that the larvae were recovered from human bodies after the active decay stage and when the body begins to dry. However, from the description of the body in case 2 it would appear likely that infestation may sometimes occur before this. Sukontason *et al.* (2007) found *P. casei* maggots in 3 human forensic cases from Thailand. They observed maggots during both skeletonization phase of succession and decomposition of the corpse. Apichat *et al.* (2007) working with pig carcasses in Thailand, found one *P. casei* during active decay. So therefore this indicates that *P. casei* are important forensic indicators because they are found during active decay and skeletonized stages.

In case 1, the maggots were of double infestation. The maggots consisted of third instar maggots of *P. casei* and *Ophyra spinigera.* In the second case, the maggots were also of double infestation. The maggots belonged to the family Piophilidae while the other infestation was an inderterminate species. These maggots were also of the third instar stage.

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