Research Note

Two cases of wound myiasis due to *Lucilia sericata* and *L. illustris* (Diptera: Calliphoridae)

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Abstract: Myiasis is the infestation with dipteran larvae which, at least for certain periods, feed on the host's dead or living tissue, liquid body-substances, or ingested food (Zumpt, 1965). Flies of this type include blowflies, also called green-bottle or bluebottle flies (Calliphoridae), flesh flies (Sarcophagidae), and also house flies (Muscidae) (Krinsky, 1988). The authors have already reported two cases of otomyiasis due to *Sarcophaga peregrina* (Japanese name: senchi-nikubae) and *S. similis* (Japanese name: nami-nikubae) (Sarcophagidae), which occurred in September, 1993 (Chigusa *et al.*, 1994). In the present paper we report two cases of wound myiasis due to *Lucilia sericata* (Japanese name: hirozu-kinbae) and *L. illustris* (Japanese name: midori-kinbae), which infested an 87-year-old woman and a 37-year-old female patient suffering from schizophrenia in May and June 1994, respectively. Although Hasegawa *et al.* (1979) reported human myiasis is probably due to *L. illustris*, identification was done only from the larvae and not the adult fly; therefore, this is the first unequivocal report of human myiasis due to this species in Japan.

CASE PRESENTATION

Case No. 1. The patient, an 87-year-old woman who lived in Utsunomiya City, was an outpatient at the dermatology department of our hospital. Six months before this incident, she had fallen and sustained an injury in the right temporal region. The injury gradually became swollen, and three weeks prior to the onset of myiasis, she began to feel pain and itching in the lesion. Histological examination

showed that the lesion was angiosarcoma. At the time of the examination the skin lesion was ulcerated and 160 dipterous larvae were collected from the ulcer on May 25, 1994. The maggots, 7-8 mm long, were initially identified as 3rd instar larvae of the family Calliphoridae from their distinctive posterior spiracle. The maggots were then reared on pork at 25°C and 60% relative humidity, and they pupated on May 29. The adult flies emerged on June 4. The larvae collected were definitively identified as the 3rd instar larvae of *Lucilia sericata* (Meigen, 1826) based on the morphological characters of the emerged adult flies.

Case No. 2. A 37-year-old woman who

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had been suffering from schizophrenia was found barely conscious after a fall and was transferred to hospital by ambulance on June 1, 1994. She had injured the left earlobe and left temporal region. Two days after admission, the nurse in charge of the patient found many milky-white legless maggots crawling on the head lesion, which had a nasty smell. The larvae, 5 mm in length, were reared on chicken meat at room temperature until June 6. Thereafter, they were reared under the same conditions as those for Case No. 1. Pupation took place on June 8, and greenbottles emerged in the morning of June 16. The maggots collected on June 1 were finally identified as the 3rd instar larvae of *Lucilia illustris* (Meigen, 1826) based on the morphological characters of the emerged adult flies.

DISCUSSION

Lucilia sericata causes human myiasis as shown in Table 1, but is also of veterinary importance along with *L. cuprina* (Japanese name: hitsuji-kinbae), both having great practical significance as primary causal agents of myiasis in sheep in Australia (Zumpt, 1965). In the present cases, 49 larvae of *L. illustris* and 160 larvae of *L. sericata* were collected, respectively. On the other hand, Chigusa *et al.* (1994) reported that 2 to 70 larvae were collected in a case of otomyiasis caused by *S. peregrina* and 1 to 50 in a case of *S. similis*. The mean number of larvae deposited at one time by a female sarcophagid is 30 to 64 (Zumpt, 1965), whereas *L. sericata* lay about 225 eggs at one time (Wall, 1993). This is the reason why numerous larvae, *i.e.*, 160, were collected in Case No. 1 (*L. sericata*).

We could not say whether or not the number of larvae collected in Table 1 corresponded to the area affected since these reports in Table 1 gave little information concerning that aspect.

As indicated by Greenberg (1984), *Lucilia* species can cause facultative myiasis

in humans, particularly in elderly or debilitated persons. Ten out of 26 cases due to *L. sericata* in Table 1 involved individuals over 60 years of age including the present Case No. 1. Although the present Case No. 2 involved a relatively young person, *i.e.*, 37 years old, the patient had been suffering from schizophrenia. Schizophrenia is a psychiatric disorder with many types of clinical manifestations. For example, in the catatonic type, the patient may spend the day sitting on the edge of a chair or crouching on the floor. Due to a loss of the sense of reality, the patient denies the world and actively resists his environment, opposing any effort to move him from his attitude and positions, often constrained and peculiar, which he may maintain for months (Kolb, 1973). This autism and/or flattening of affect may make it easy for the fly to deposit eggs or larvae on the patient's body surface and the fly larvae, therefore, will not be removed even if they grow to the 3rd instar. We, therefore, again emphasize that not only elderly or debilitated persons but also those with psychiatric disorders such as schizophrenia should be protected from flies, and doctors and nurses should pay attention to them especially when they are injured or have an ulceration caused by infiltration of malignancy and so on.

According to the references cited in Table 2, the number of human myiasis due to *L. illustris* is smaller compared with that due to *L. sericata*. A possible reason for this is that *L. sericata* are found all over the world while *L. illustris* are not found in the Amami, Okinawa, Yaeyama islands, Taiwan, South Asia, South Pacific, Australia, Russia, South America and Africa (Kano and Shinonaga, 1968).

Although Hasegawa *et al.* (1979) reported human myiasis is probably due to *L. illustris*, which was identified in the larval stage and they described in their paper that "however, the cephalopharyngeal sclerite of this maggot most resembles that of *L. illustris*, the final identification should be deferred." Therefore, the pres-

Table 1. Human myiasis due to *Lucilia sericata* (*Phaenicia sericata*) reported worldwide.

Case No.	Patient			Onset	Larva			Author (year)
	Age	Sex	Nationality and/or race		Location	Instar	Number	
1	53y	F	American, white	Nov.	nasal opening	2	6+	Ryckman and Halsted (1952)
2	26d	M	American	May	navel	?	50-60	Pratt (1956)
3	74y	F	Japanese	?	ear	3	11	Yoshii and Ohkawa (1957)
4	68y	M	American, white	Jun.	foot	?	63	Horen (1967)
5	63y	M	Chilean	?	?	?	?	Reyes <i>et al.</i> (1967)
6	50y	M	Chilean	?	?	?	?	"
7	71y	M	Chilean	?	?	?	?	"
8	54y	M	Chilean	?	?	?	?	"
9	67y	M	Chilean	?	?	?	?	"
10	3m	F	Chilean	?	?	?	?	"
11	1y	M	Chilean	?	?	?	?	"
12	54y	M	Chilean	?	?	?	?	"
13	54y	F	American	Jul.	thigh	2	8	Townsend and Hall (1976)
14	57y	F	Japanese	Oct.	head	3	157	Kouya and Ueno (1977)
15	74y	F	Japanese	Dec.	ear	?	11	Ohkawa (1979)
16	25y	F	Japanese	Jul.	ear	?	1	"
17	8y	M	American	Jul.	nostril	3	10	Magnarelli and Andreadis (1981)
18	90y	M	Japanese	?	urethra	3	1	Yazaki <i>et al.</i> (1984)
19	?	M	American	?	tracheotomy	3	20	Greenberg (1984)
20	?	F	American	?	nose	3	13	Greenberg (1984)
21	9y	F	Pakistani	Aug.	scalp	3	62	Khan and Khan (1987)
22	79y	M	Japanese	May	neck tumor	2	19	Chigusa and Sugiyama (1987)
23	5y	M	Japanese	Sept.	head	2	1	Ohmi <i>et al.</i> (1988)
24	76y	M	Japanese	Sept.	chest	3	60+	Kamimura <i>et al.</i> (1991)
25	?	?	Egyptian	?	?	?	?	Morsy <i>et al.</i> (1991)
26	87y	F	Japanese	May	head	3	160	Present case

y; years old, m; months old, d; days old, M; male, F; female, +; or more, ?; no record.

Table 2. Human myiasis due to *Lucilia illustris* reported worldwide.

Case No.	Patient			Onset	Larva			Author (year)
	Age	Sex	Nationality and/or race		Location	Instar	Number	
1	?	?	Canadian	?	leg	?	?	James (1947)
2	?	?	American	?	head	?	?	James (1947)
3*	75y	M	Japanese	Sept.	head	3	15	Hasegawa <i>et al.</i> (1979)
4	37y	F	Japanese	Jun.	head	3	49	Present case

y; years old, M; male, F; female, *, probable case (not confirmed).

ent Case No. 2, which is the first confirmed case of human myiasis due to *L. illustris* in Japan, is thus noteworthy.

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REFERENCES

Chigusa, Y. and K. Sugiyama (1987) A case report of myiasis due to *Phaenicia sericata* (Diptera: Calliphoridae). *J. Aichi Med. Univ. Assoc.*, **15**: 655-658 (in Japanese with English summary).

- Chigusa, Y., K. Tanaka, H. Yokoi, H. Matsuda, Y. Sasaki, Y. Ikadatsu and K. Baba (1994) Two cases of otomyiasis caused by *Sarcophaga peregrina* and *S. similis* (Diptera: Sarcophagidae). *Jpn. J. Sanit. Zool.*, **45**: 153–157.
- Greenberg, B. (1984) Two cases of human myiasis caused by *Phaenicia sericata* (Diptera: Calliphoridae) in Chicago area hospitals. *J. Med. Entomol.*, **21**: 615.
- Hasegawa, H., H. Sekikawa, K. Oka and M. Hosokawa (1979) A case of human myiasis in Niigata Prefecture, Japan. *Niigata Igakkai Zasshi*, **93**: 612–614 (in Japanese).
- Horen, W. P. (1967) Myiasis of the foot caused by *Phaenicia sericata* (Meigen). *Calif. Med.*, **107**: 47–48.
- James, M. T. (1947) The flies that cause myiasis in man. *U.S. Dept. Agr. Misc. Pub.*, **631**: 2–123.
- Kamimura, K., R. Arakawa and M. Kosugi (1991) A case report on wound myiasis due to the common greenbottle fly, *Phaenicia sericata* (Meigen). *Jpn. J. Sanit. Zool.*, **42**: 151–152 (in Japanese with English summary).
- Kano, R. and S. Shinonaga (1968) *Fauna Japonica, Calliphoridae (Insecta: Diptera)*, 188 pp., Biological Society of Japan, Tokyo.
- Khan, M. A. J. and R. J. Khan (1987) Hematoma of scalp in a baby caused by the common greenbottle *Lucilia sericata* (Meigen) (Diptera: Calliphoridae) in Karachi, Pakistan. *Jpn. J. Sanit. Zool.*, **38**: 103–105.
- Kouya, M. and A. Ueno (1977) A case of human myiasis occurred on basal cell carcinoma. *Rinsho-hifuka. (Tokyo)*, **19**: 465–468 (in Japanese).
- Kolb, L. C. (1973) Schizophrenic psychoses. In: *Modern Clinical Psychiatry*, (ed. Lawrence C. Kolb) pp. 308–356, W. B. Saunders Company, Philadelphia.
- Krinsky, W. L. (1988) Myiasis and Tungiasis. In: *Cecil Textbook of Medicine 18th ed.* (ed., Wyngaarden, J. B. and L. H. Smith), pp. 1925–1926, W. B. Saunders Company, Philadelphia.
- Magnarelli, L. A. and T. G. Andredis (1981) Human cases of furuncular, traumatic, and nasal myiasis in Connecticut. *Am. J. Trop. Med. Hyg.*, **30**: 894–896.
- Morsy, T. A., M. E. Fayad, M. M. I. Salama, A. H. A. Sabry, A. O. M. E. Serougi and K. F. Abdallah (1991) Some myiasis producers in Cairo and Giza abattoirs. *J. Egy. Soc. Parasitol.*, **21**: 539–546.
- Ohkawa, T. (1979) Biotic foreign bodies in otolaryngology. *Practica Otologica-Kyoto*, **72**: 1105–1175 (in Japanese with English summary).
- Ohmi, M., H. Tanuma, A. Arai and A. Umezawa (1988) A case of kerion celsi with cutaneous myiasis. *Jpn. J. Clin. Dermatol.*, **42**: 727–731 (in Japanese).
- Pratt, H. D. (1956) Human myiasis due to *Phaenicia sericata* (Meigen) in Verginia. *Proc. Ent. Soc. Wash.*, **58**: 14.
- Reyes, H., H. Hevia, H. Schenone and J. Sapunar (1967) Myiasis humana por *Phaenicia sericata* (Meigen, 1826) en Chile. (Diptera, Calliphoridae). *Biol. Chil. Parasitol.*, **22**: 168–171.
- Ryckman, R. and B. W. Halstead (1952) Report of a case of human nasal myiasis by the greenbottle fly, *Phaenicia sericata*, in San Bernardino County, California. *Am. J. Trop. Med. Hyg.*, **1**: 711–712.
- Townsend, L. H. and R. D. Hall (1976) Human myiasis in Virginia caused by *Phaenicia sericata* (Meigen) (Diptera: Calliphoridae). *Proc. Entomol. Soc. Wash.*, **78**: 113.
- Wall, R. (1993) The reproductive output of the blowfly *Lucilia sericata*. *J. Insect Physiol.*, **39**: 743–750.
- Yazaki, S., S. Fukumoto, K. Yoshida and G. Ishida (1984) Two cases of myiasis. *Jpn. J. Sanit. Zool.*, **35**: 209 (in Japanese).
- Yoshii, M. and T. Ohkawa (1957) A case of otomyiasis caused by *Phaenicia sericata*. *J. Otolaryngol. Jpn.*, **60**: 994 (in Japanese).
- Zumpt, F. (1965) *Myiasis in Man and Animals in the Old World A Textbook for Physicians, Veterinarians and Zoologists*, 267 pp., Butterworth & Co., London.

摘 要

ヒロズキンバエとミドリキンバエによる傷症ハエ症の2例

栃木県宇都宮市在住の87歳の女性の頭部の血管肉腫に発生したヒロズキンバエによるハエ症と、栃木県下都賀郡藤岡町在住の37歳の精神分裂病の患者の頭部に発生したミドリキンバエによるハエ症を報告した。ミドリキンバエによる確実なヒトのハエ症としては、今回の症例2が日本で第一例目である。また老人や衰弱した意識レベルの低い患者のみでなく、今回の第二例目の様な精神疾患においても、ハエ幼虫症の発生に十分注意が必要であることを強調したい。