

That's the Way the Cookie Crumbles

Case Study of Presumptive *Trogoderma*-Caused Canthariasis

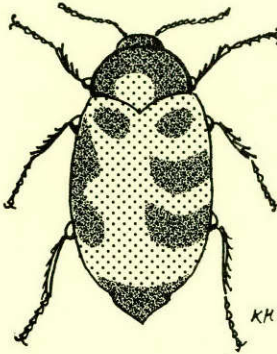


Figure 1. *Trogoderma versicolor* Creutz. Usual adult size is 2-3.5mm.

On February 25, 1991, an otherwise healthy 20-year-old soldier suffered gastrointestinal distress two and one-half hours after eating commercially prepared cookies. The soldier's complaints, which subsided within 24 hours, included lower abdominal pains, cramps, and vomiting. Because entomologic examination of the uneaten cookies revealed two *Trogoderma variable* Ballion and exuviae (molted skin containing setae), canthariasis was the presumed cause of the soldier's illness. This is the first documented case of canthariasis caused by *T. variable* infestation.

Canthariasis is defined as the invasion of body tissue or cavities by beetle larvae.¹ The process of digestion normally kills ingested arthropods, and their body fragments are safely excreted. In some cases, however, health problems can result when a person consumes food that contains whole beetles or large amounts of their excretory or secretory products, body fragments, eggs, or larvae. For instance, a very large concentration of *Trogoderma* setae (long slender filaments with sharp bristles) can cause gastrointestinal trauma, or even a systemic allergic reaction, when the setae penetrate tissue with which they come in contact.²

Two documented cases of canthariasis caused by different species of *Trogoderma* include: a four-month old infant who had eaten baby cereal infested with *Trogoderma glabrum* and another infant who had eaten cereal infested with *Trogoderma ornatum*. Both showed signs of digestive distress including diarrhea.³

The arthropod responsible for the three presumed cases of canthariasis described in this report are beetles in the family *Dermestidae*. Some of the common *Trogoderma* species in the United States are: *T. simplex*, *T. glabrum*, *T. variable*, *T. ornatum*, *T. inclusim*, *T. sternale*, *T. grassmani*, and *T. versicolor* (Figure 1). *Trogoderma* species are most commonly found in packaged foods (Figure 2).

Major Nelson R. Powers, Medical Entomologist from Brooke Army Medical Center, Fort Sam Houston, San Antonio, Texas, reported the soldier's case. This case study illustrates a public health problem that can arise from infestation of food products by arthropods. The opinions or assertions made in this report are the independent views of the author and are not to be attributed to the Department of the Army or the Department of Defense.

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Figure 2. *Trogoderma* larva feeding on spaghetti. Usual larva size is 8mm.

References:

1. Harwood RF, James MT. *Entomology in Human and Animal Health*. McMillan Pub Co, Inc New York, 1979, p113.
2. Gorham JR. HACCP and Filth in Food: The Detection and Elimination of Pest Infestation. *J Environ Health* 1989;52(2):84-6.
3. Okmura GT. A Report of Canthariasis and Allergy Causes by *Trogoderma* (Coleoptera: Dermestidae). *Calif Vector News* 1967;14(3):19-22.



Case Report of Human Tungiasis

On September 20, 1990, a Southeast Texas physician removed a wart-like nodule from a 12-year-old boy's left foot and sent the specimen to the TDH Bureau of Laboratories. The nodule and surrounding tissue, excised from the boy's second toe, contained a *Tunga penetrans* flea and 142 flea eggs (Figure 1). The physician's report stated that the patient was a member of a missionary family which has lived in Brazil for the previous 12 years. The patient's mother had first noticed the lesion several weeks prior to their return to the United States and the boy's medical examination. A large proportion of the members of the Brazilian community in which this family worked suffered debilitating, and often multiple, nodules on their feet.

The smallest known flea, *Tunga penetrans* is often referred to as the "chigoe," "chigger," or "sand" flea. It is widely

distributed in parts of Central and South America as well as Central and East Africa. Humans, pets, and other domestic animals may suffer from the chigger flea. The extremely active gravid female burrows into her host's flesh with her claws and pointed head. Following full skin penetration, only her posterior segments remain visible. She feeds on papillary dermis exudate and blood, and her abdomen enlarges to the size of a pea within 7 to 14 days. As many as 300 eggs may be extruded through the opening in the host's skin before the flea dies.

Although the female flea may attack and cause nodules on any part of the body, the most common site is between the toes. The host may experience a slight itching as the flea penetrates the skin, and pain as the gravid female enlarges. Secondary bacterial infections which lead to lymphadenitis often develop.

Diagnosing this condition may be difficult in areas where the chigger flea is not common. Differential diagnoses include warts, melanomas, and mycotic granulomas. Persons visiting endemic areas should obtain a booster tetanus vaccination and wear protective footwear.

Submitted by: Paul V. Fournier, MPH, BCE, Supervisor, Parasitology, Entomology Branch, Microbiological Services Division.

Source: Harwood RF, James MT. *Entomology in Human and Animal Health*. McMillan Pub Co, Inc New York, 1979, pp327-8.

Special thanks to Liam Bui, MD, of Brazosport Memorial Hospital in Lake Jackson, Texas, for reporting this case.



Tunga penetrans is often referred to as the "chigoe," "chigger," or "sand" flea.

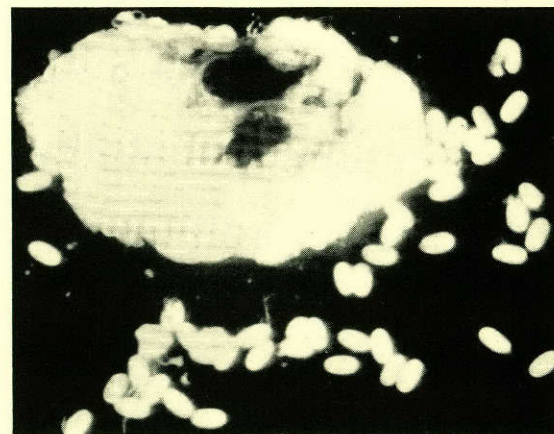


Figure 1. Exposed terminalia of female sand flea, *Tunga penetrans*, excised from patient's foot. Note extruded flea eggs (0.5mm).

February 1993

Monthly Statistical Summary of Selected Reportable Diseases

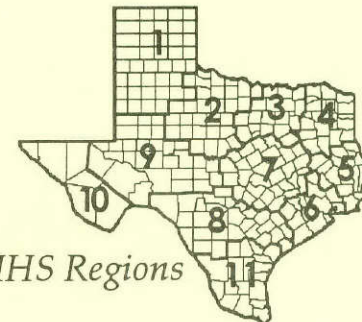
Selected Diseases/Conditions	DHHS Region											Selected Texas Counties								This Month		Cumulative ¹	
	1	2	3	4	5	6	7	8	9	10	11	Bexar	Dallas	El Paso	Harris	Hidalgo	Nueces	Tarrant	Travis	1992	1993	1992	1993
Sexually Transmitted Diseases²																							
Syphilis, primary and secondary	0	1	88	11	60	61	9	7	5	2	2	6	37	2	38	1	0	39	6	261	246	502	444
Congenital Syphilis	0	0	8	0	0	39	6	1	0	0	3	0	6	0	39	2	0	0	4	13	57	27	66
Penicillinase-producing <i>Neisseria gonorrhoeae</i> (PPNG)	0	0	13	0	0	11	7	16	0	0	0	16	8	0	11	0	0	1	0	119	47	326	90
Enteric Diseases																							
Salmonellosis	2	0	2	0	0	1	3	4	3	2	4	0	2	2	0	0	0	0	0	88	21	189	70
Shigellosis	1	0	5	0	1	2	40	15	1	3	3	0	0	3	1	0	2	0	26	90	71	194	219
Hepatitis A	1	0	3	3	0	12	3	6	1	21	5	0	2	21	12	2	1	0	1	127	55	274	177
Campylobacteriosis	0	0	0	0	3	1	5	1	0	0	0	0	0	0	0	0	0	0	2	41	10	103	57
Bacterial Infections																							
H. influenzae, invasive	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	7	1	10	2
Meningococcal, invasive	0	0	2	0	0	1	4	0	0	0	1	0	0	0	0	0	1	0	0	12	8	26	18
Lyme disease	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	8	0
Vibrio species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Other Conditions																							
Influenza & flu-like illness	103	396	2,671	1,027	213	1,468	588	686	174	240	1,607	0	0	240	1,410	0	1,469	13	3	10,502	9,173	15,238	12,683
Hepatitis B	1	3	1	2	2	4	7	1	0	1	3	0	1	1	4	1	0	0	5	148	25	291	87
Adult elevated blood lead levels	1	0	11	0	0	0	0	6	0	0	0	6	5	0	0	0	0	0	0	36	18	112	58
Animal rabies - total	0	0	0	0	0	0	0	1	0	0	7	0	0	0	0	6	0	0	0	9	10	15	24
Animal rabies - dogs and cats	0	1	5	1	0	2	3	2	9	0	16	0	0	0	0	6	0	0	0	38	39	65	72
Tuberculosis Disease²																							
Children (0-14 years)	0	0	1	0	0	5	0	0	0	0	0	0	1	0	5	0	0	0	0	6	6	8	10
Adults (>14 years)	1	1	15	4	2	30	0	4	1	0	5	3	12	0	23	1	1	3	0	85	63	113	142
Injuries^{2, 3}																							
Spinal Cord Injuries	6	0	4	0	0	6	2	29	1	0	0	26	1	0	2	0	0	2	1	N/A	48	N/A	53

1. Cumulative to this month.
 2. Data for the STD's, Tuberculosis, and spinal cord injuries are provided by date of report, rather than date of onset.
 3. Voluntary reporting.

1992 POPULATION ESTIMATES

DHHS REGIONS	
1	749,158
2	530,279
3	4,457,134
4	919,677
5	676,718
6	4,055,407
7	1,785,214
8	1,849,649
9	528,345
10	647,298
11	1,416,866

SELECTED TEXAS COUNTIES	
Bexar	1,225,595
Dallas	1,923,031
El Paso	622,966
Harris	2,931,867
Hidalgo	408,450
Nuece	300,700
Tarrant	1,277,625
Travis	593,536



DHHS Regions



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Vaccine-Preventable Disease Update

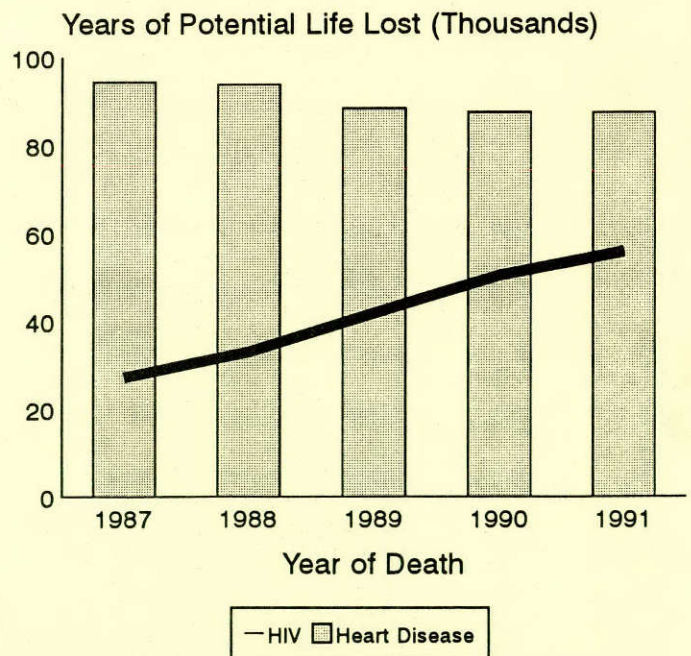
Suspected/confirmed cases reported with onsets from ¹ 2/21/93 - 3/6/93

	County	# of Cases	Date of Onset
Measles	Cameron	1	2/27/93 *
	Coleman	1	2/26/93
	Dallas	1	2/21/93
	Lubbock	1	2/27/93 *
	Midland	1	2/23/93
	Ochiltree	1	2/26/93
	San Patricio	1	2/24/93
	Uvalde	1	2/22/93
	Val Verde	1	2/23/93
	Rubella	Dallas	2
Maverick		1	3/05/93 *
Pertussis	None		2/23/93

* latest known onset

YTD Measles 44 Rubella 24 Pertussis 10

HIV-Related Premature Mortality in Texas
Compared to the Leading Cause of Death--Heart Disease



Source: Texas Bureau of Vital Statistics and the Epigram Program.
Years of potential life lost are the years between an early death and the age of 65.