

Filth and Decomposition in Prawns from Peeling Sheds Around Cochin

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Samples of prawn meat collected from peeling sheds around Cochin were examined for filth and decomposition. These samples were found to be contaminated by house flies/house fly fragments in 7% samples, flies of the genus *Drosophila* in 12% samples, red ants/red ant fragments in 19% samples and head louse in 1% samples. 5-6% of the samples were found to be decomposed. It was observed that the smaller the size of the prawn, the higher the contamination by flies and ants and also decomposition.

Contamination in frozen prawns by filth and also the freezing of decomposed prawns are major problems encountered by the sea-food industry of Asian countries. Any food product is considered adulterated if it contains filth and putrid or decomposed substances (Dziezak, 1987). U.S.A. is very specific about contamination of prawn products with filth and decomposed substances and stipulated permitted levels of these substances. Between March and August 1979 US FDA sampled and tested 835 entries of shrimps from 6 Asian countries for filth and decomposition and 223 were found violative and consequently denied entry (Holten, 1986), Thomas and Varma (1985) analysed samples of frozen prawns exported from India for filth and found flies, fly fragments, hairs, lice, red ants etc. in few samples but it was within US FDA permitted levels. Headless shrimps were practically free from filth.

The present study was conducted to assess the extent of contamination of prawns collected from peeling sheds around Cochin by filth and decomposed prawns.

Materials and Methods

Ninety samples of PD, PUD and FR (fantail round) prawns (one kg each) of different species (*Metapenaeus dobsoni*, *Parapenaeopsis stylifera*, *Penaeus indicus*, *M. monoceros* and *M. affinis*) and size grades were collected from nine peeling sheds around Cochin for filth. The samples were mixed with equal quantities of

crushed ice, sealed in separate polythene bags, transported to the laboratory and kept in ice. The samples were analysed either the same day or the next day. The contents of the bag were transferred to a 12" diameter standard No. 8 mesh sieve nested on top of a standard 140 mesh sieve. The inside of the polythene bag was washed thoroughly and the washings were also transferred to the No. 8 sieve. The prawns and ice pieces in the No. 8 sieve were washed individually with a jet of water and removed, and during washing the washings were collected in the No. 8 sieve. Finally the inside of the No. 8 sieve was washed with a jet of water and contents in the sieve were observed for filth with naked eye. The material that passed through the No. 8 sieve and collected in the No. 140 sieve was transferred into a Wildman trap flask of one litre capacity using water (AOAC, 1975). The analysis was continued as in US FDA procedure (E.I.A., 1986 b). Samples were also collected from the same prawns, mixed with equal quantities of crushed ice, sealed in separate polythene bags, transported to the laboratory and examined for decomposition by the US FDA procedure (E.I.A., 1986 a, b; Geetha, 1984). Count was determined by counting the number of individual units in a pound of the material. But in the case of tiny shrimp (100 and above unit per pound) the number of shrimp in 50 g sample was counted and the number of units per pound was calculated.

Results and Discussion

Out of the 90 samples analysed, 4 were found to contain one whole house fly (*Musca domestica*) each, 2 were found to contain one wing of housefly in each sample and 11 were found to contain one fly of the genus *Drosophila* in each sample. Cockroaches, cockroach fragments and hairs were absent in all the samples. In addition to the above red ants (*Monomorium pharaonis*, and louse (*pediculus humanus capitis*) were isolated. In 16 samples whole red ants and in one sample red ant fragments (head, abdomen and legs) were present. Out of the 16 samples 13 were found to contain 1 each, 2 were found to contain 2 each and one was found to contain 3 red ants. In one sample a louse was present.

Table 1. *Percentage of samples of prawn of different size grades contaminated with flies and fly fragments and red ants and red ant fragments.*

Size grades (count/lb)	Percentage of samples contaminated with	
	Flied and fly fragments	Red ants and red ant fragments
501 and above	38	38
301-500	24	24
201-300	20	12
131-200	17	28
101-130	0	0
91-100	0	0
81-90	0	0
61-70	0	0
36-40	0	0

The percentage of samples of prawn meat of different size grades contaminated with flies/fly fragments and red ants/red ant fragments are given in Table 1. From the table it is clear that fly contamination decreases with decrease in count per pound. This may be due to the following reasons. The rate of spoilage is more in small sized prawns (Connell, 1980; Wheaton & Lawson, 1985) and hence chances

of production of fishy/spoiled odours during pre-processing stages are more in small sized prawns. Since these odours attract flies, the chances of fly contamination is more in small sized prawns. The efficiency of washing is less in small sized prawns compared to big prawns and hence fly contamination will be more in small sized prawns. Also more care is usually given to prawns of big size. It is also seen from the table that contamination with red ants decreases with decrease in count per pound. The reasons applicable to fly contamination may be suitable in this case too. Chilling decreases the spoilage rate and hence reduces the fly and ant contaminations. Out of the nine peeling sheds from which samples were taken, sand and red ants were absent in the samples collected from 2 peeling sheds. In almost all the samples from the rest of the peeling sheds sand was observed. Flies were present in samples collected from all peeling sheds. Hence it can be inferred that proper manual washing can remove complete sand and red ants but not flies. The percentage of samples of prawn meat of different species contaminated with flies and ants are given in Table 2. The absence of ants and flies in *M. monoceros* and *M. affinis* may be due to insufficient number of samples taken for analysis.

Table 2. *Percentage of samples of prawn meat of different species contaminated with flies and fly fragments and red ant and red ant fragments*

Species	Percentage of samples contaminated with	
	Flies and fly fragments	Red ants and red ant fragments
<i>Metapenaeus dobsoni</i>	24	24
<i>Parapenaeopsis stylifera</i>	17	23
<i>Penaeus indicus</i>	17	0
<i>M. monoceros</i>	0	0
<i>M. affinis</i>	0	0

Out of the 90 samples analysed 5 were found to be decomposed. These five samples did not reach advanced decomposition level, but possessed slight but definite decomposed odour. Percentage of decomposed samples in different size grades is given in Table 3. From the table it is clear that the percentage of decomposed samples increases as the size of the prawn decreases. This is due to the higher rate of spoilage in smaller prawns and less care given to the small sized prawns. Out of the five decomposed samples 4 included 6 samples collected from a peeling shed. This showed the inefficiency of the manager of the peeling shed. Decomposition is readily perceptible to an experienced examiner and no laboratory facility is required for the examination. Hence the technologist who is in charge of purchasing prawns in the processing plant can identify decomposition. Since the small sized prawns are more prone to decomposition during pre-processing stages, more care such as proper chilling, reducing the time lag between harvesting and dressing should be given.

Table 3. Percentage of decomposed samples in different size grades

Size grades (count/lb)	Percentage of decomposed samples
501 and above	25
301 - 500	4
201 - 300	8
131 - 200	0
101 - 130	0
91 - 100	0
81 - 90	0
61 - 70	0
36 - 40	0

From the same lot of prawns, samples for filth and decomposition were taken. Percentage of fly and ant contamination was more compared to that of decomposition. Fly and ant contamination were observed upto the size 131-200 (count/lb), while decomposition was identified

only upto the size 201-300 (count/lb). From these it can be concluded that fly and ant contamination indicates decomposition or the stage just prior to decomposition.

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