

Study of Shell, Meat and Moisture Separation from Fresh *Acetes*

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Abstracts

An attempt has been made in present study to separation of the *Acetes* meat free of shell, meat and moisture. *Acetes* shrimp is available year round in whole dried form in the market. As per the prevailing practice, jawala is sundried on the beach and sold in the dried form for human consumption in the domestic market. However, functional properties of protein in fresh *Acetes* are lost after it is dried. Hence, this necessitates the use of *Acetes* in fresh condition so as to utilize all the functional properties of *Acetes* protein to the maximum extent. Fresh meat of *Acetes* can be used for the preparation of *Acetes* mince thereby retaining their desired functional properties. Similarly, the product can be prepared from fresh *Acetes* meat.

Keywords: *Acetes*; Crustacea; krill; Baddar.

Introduction

The members of *Acetes* species popularly known as 'Paste shrimp' belong to the family Sergestidae of class Crustacea. Locally known as Jawala in India, most of the *Acetes* shrimp is landed along the north west coast, i.e. in the states of Gujarat and Maharashtra. During the year 2011-12, about 1, 64,951 tons of non-penaeid prawns were landed along the Indian coast (CMFRI, 2012). Attempts have been made to separation of meat from *Acetes*, Patil (2000) employed five different methods for isolation of flesh from jawala such as separation of flesh by heating, centrifugation, isoelectric focusing, dense phase separation, pulverization by using Rovisapulverizer and meat separator. Among these, in dense phase separation method the yield of meat was 70.16% at 10% salt concentration. In the case of 9% and 11% salt concentration there was partial separation, whereas at 7% and 13% salt concentration there was no separation. The meat yield in Rovisapulverizer was 53% and in meat separator it was 12.20%. Attempts have been made to Separation

of meat from krill. Lagunov *et al.* (1974) tried to separate the meat from krill. Krill was pressed to get juice, which was later coagulated and frozen at -32°C. This required lengthy procedure and costly equipments. Rehbein (1980) prepared krill meat from fresh krill by means of a roller peeler originally designed for the shrimp industry. After separation from the shells, the meat was washed with freshwater and in part supplied with additives. Because of the high water content of krillmeat, powders of polyphosphates or solid salts of organic acids were thoroughly mixed with the meat, and then the meat were frozen in plate freezer and stored at -30°C. Christian (1980) separated the flesh from Antarctic krill by using Baddar bone separator.

Materials and Methods

The fresh *Acetes* immediately after catch was procured from Harna landing centre of Ratnagiri and chilled and transported to College of Fisheries, Ratnagiri. This was thawed and by catch fishes, other animals and plants were removed and *Acetes* was subjected to the following treatment of separation of shell from fresh *Acetes*. Whole *Acetes* was weighed and subjected to shell separation by putting in meat separator of Baddar 600 make was used to separate the meat and shell. The size of holes of the perforated drum was 3 mm. Then the separated meat was subjected to squeezing in the thin synthetic cloth to

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remove excess liquid (Moisture+Solids). The separated meat, shell and liquid were weighed. The samples obtained at each stages of the process were subject to analysis for the content of moisture, shell and meat.

Result and Discussion

Proximate composition of whole *Acetes* and squeezed separated *Acetes* meat had low fat content 1.0 to 2.4% and high moisture content between 84.2 and 77.03% respectively.

Protein content of fresh whole *Acetes* and squeezed separated *Acetes* meat were 12.08 and 16.87% and ash content of fresh whole *Acetes* and squeezed separated *Acetes* meat were 2.72 and 2.34% respectively (Table 1 and Figure 1 & 2). The percentage yield of separated *Acetes* meat was found to be 65.23% and residual shell was 30.47%.

Further after squeezing in thin nylon cloth, the yield of squeezed *Acetes* meat was found to be 42.01% and squeezed *Acetes* liquid was found to be 19.97%. The squeezed *Acetes* meat had 76.5% of moisture and reduced shell content of 0.4% where as squeezed

Acetes liquid had 91.2% of moisture and reduced meat content of 8.8%.

It was observed that 65.25% of separated *Acetes* meat and 30.47% of residue shell was obtained after passing the drained whole *Acetes* through the meat separator (diameter of wholes on the drum being 3 mm) Table 2 and Figure 3. Further on squeezing after separated *Acetes* meat in thin synthetic cloth, 42.01 % of squeezed separated *Acetes* meat and 19.97 % squeezed *Acetes* liquid were obtained. Similarly Nagothkar (2013) reported meat yield of 64.44% and shell yield of 31.52 % further Suzuki (1981) also reported yield of krill meat 63.8 % and shell yield of 24.1% while separating by paule deboner. The moisture content of the separated *Acetes* meat, separated shell, squeezed *Acetes* meat and squeezed *Acetes* liquid were found to be 81.1%, 39.4%, 76.5% and 91.2% respectively.

The meat content of the separated *Acetes* meat, separated shell, squeezed *Acetes* meat and squeezed *Acetes* liquid were found to be 18.5 %, 14.4 %, 23.6 % and 8.8% respectively. The shell content of the separated *Acetes* meat, separated shell, squeezed *Acetes* meat and squeezed *Acetes* liquid were found to be 0.4%, 46.2%, 23.6% and 0% respectively.

Table 1: Proximate composition of raw *Acetes*

Sample	Whole <i>Acetes</i>	Squeezed separated <i>Acetes</i> meat
Proximate composition		
Moisture (%)	84.2	77.03
Protein (%)	12.08	16.87
Crude fat (%)	1.0	2.40
Ash (%)	2.72	2.34

Table 2: Percentage yield *Acetes* meat, shell and liquid

Sr. No	Sample	Yield (%)
1.	Cleaned whole <i>Acetes</i> (CWA)	99.53
2.	Waste	0.47
3.	Drained liquid (DL)	18.05
4.	Drained whole <i>Acetes</i> (DWA)	79.98
5.	Separated <i>Acetes</i> meat (SAM)	65.23
6.	Residue shell (R shell)	30.47
7.	Squeezed <i>Acetes</i> meat (SQAM)	42.01
8.	Squeezed <i>Acetes</i> liquid(SQAL)	19.97

Table 3: Percentage of moisture, meat and shell at different stages

Particulars	Moisture (%)	Shell (%)	Meat (%)
Cleaned whole <i>Acetes</i> (CWA)	84.2	6.4	9.4
Drained whole <i>Acetes</i> (DWA)	82	6.4	11.6
Separated <i>Acetes</i> meat (SAM)	81.1	0.4	18.5
Residue shell (R shell)	39.4	46.2	14.4
Squeezed <i>Acetes</i> meat (SQAM)	76.5	0.4	23.6
Squeezed <i>Acetes</i> liquid(SQAL)	91.2	0	8.8

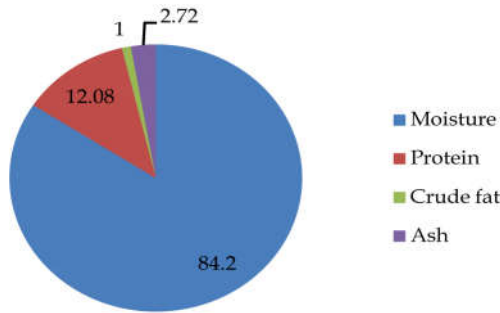


Fig. 1: Proximate composition of whole *Acetes*

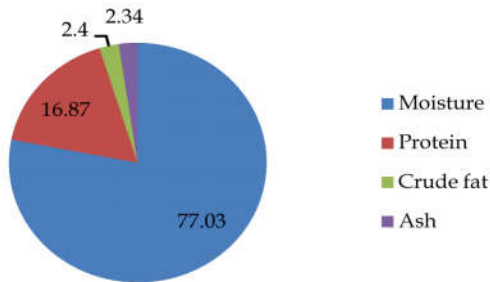
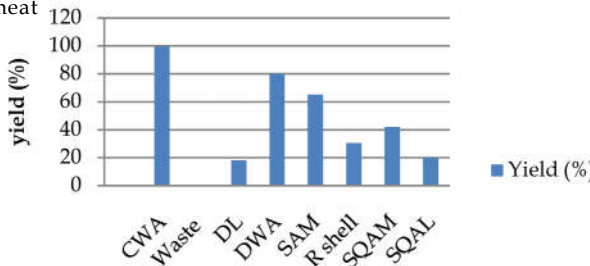


Fig. 2: Proximate composition of squeezed separated *Acetes* meat



Different stages of meat separation

Fig. 3: Percentage yield *Acetes* meat, shell and liquid

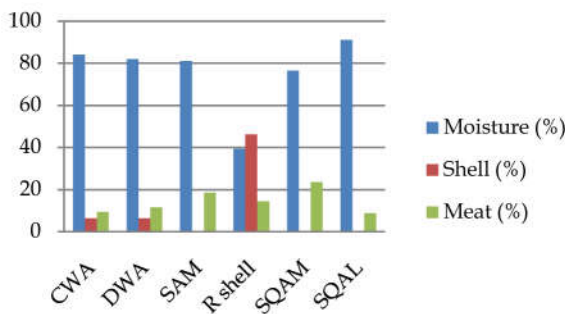


Fig. 4: Percentage of moisture, meat and shell at different stage

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Note: Cleaned whole *Acetes* (CWA), Drained whole *Acetes* (DWA), Separated *Acetes* meat (SAM), Residue shell (R shell), Squeezed *Acetes* meat (SQAM), Squeezed *Acetes* liquid (SQAL).

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