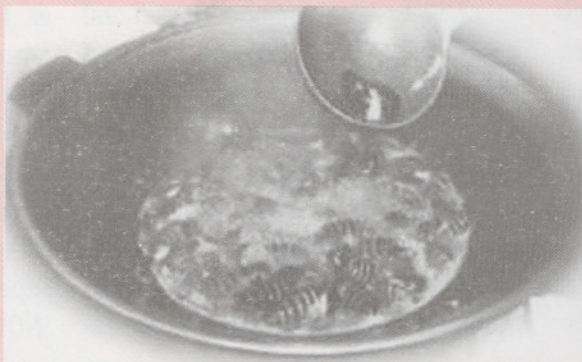


Nutritive value of non-mulberry and mulberry silkworm pupae

Traditionally consumed unconventional food items may supplement the dietary requirements of a population, thus preventing the development of a wide range of diseases associated with malnutrition.

Amongst the various species of silkworm the mulberry silkworms (*Bombyx mori*) and the non-mulberry silkworms namely *Attacus ricinii* locally known as 'Eri', *Antherae assama* locally known as 'Muga' and *Antherae paphia*, 'Tasar' are of common use in sericulture. The bulk production of 'muga' cocoons occurs in upper Assam. Many communities of Assam traditionally consume the pupae of mulberry and non-mulberry silkworms. Amongst them, pupae are known to be rich source of fat, but there is no available information on the nutritive value of pupae. The scientists at Regional Medical Research Centre, N.E. Region, Dibrugarh, Assam. evaluated nutritive value and consumption pattern of pupal stages of mulberry (*Bombyx mori*) and non-mulberry silkworms (*Attacus ricinii*, 'Eri' and *Antherae assama* 'Muga') traditionally accepted and consumed in Assam.



During experiment the cocoons were stored at 10°C for 8-10 days and processed before analyzing for food value. They were boiled for 30 minutes at 100°C. The pupae were taken out from cocoons, blotted on filter paper and dissected to remove intestine and waste material present. The proximate compositions were then determined according to the Association of Official Analytical Chemists methods.

The moisture content was determined by drying at 130°C for 1 hour (method 14.004); the crude protein content by the Kjeldhal method (% protein $61\%N \times 6.25$) (method 14.063); the crude fat content using dried ether by soxhlet extraction; the crude fibre content by dilute acid and alkali hydrolysis (method 7.054); the ash content by using

the muffle furnace at 600°C to constant weight (method 14.006). The carbohydrate content was determined by difference. The energy content (in kilo Joules) was determined by multiplying percentage of crude fat, crude protein and carbohydrate by factors of 37.7, 16.7 and 16.7, respectively.

The proximate compositions (%) for non-mulberry and mulberry silkworm pupae were in the range of: total protein (12 to 16%), total fat (11 to 20%), carbohydrate (1.2 to 1.8%), moisture (65 to 70%) and ash (0.8 to 1.4%). The energy contents of the silkworm pupae were in the range of 706 to 988 kJ. Thus proximate composition suggested that these unconventional food items (pupae) could be a good source of protein and fat and these unconventional food items with high cultural acceptability and nutritive value may be utilized in formulating potential alternate recipe for malnourished population as well as nutritious delicacy for others [Mishra *et al*, *Nutr Res*, 2003, **23**(10), 1303-1311].

Allergies related to insect consumption by Human beings

The practice of entomophagy is an old and well-established practice. This practice may be due to reputed nutritional or medicinal qualities of certain food insects. However, improper methods of selection and preparation can largely nullify the health concerns associated with eating food insects. More common allergic reactions attributable to insects include those caused by contacting body parts or waste products or inhaling microscopic dust particles composed of pulverized carcasses, cast skins and excreta. Allergies caused by contacting or inhaling insect material can cause eczema, dermatitis, rhinitis, congestion and bronchial asthma (http://www.hollowtop.com/finl_html/allergies.htm).