

Bajan Achatina

An Alternative Control of the Giant African Snail through Human Consumption in Barbados

By: Asma Babar, Nathaniel Freeman, Christie O'Loughlin and Aileen Shu-Yu Wong (McGill University)
Mentored by: Dr. Danielle Donnelly, Mr. Guillermo Stoley, and Dr. Chris Hiller.

Background The Giant African Snail (GAS), known as *Achatina fulica*, is a worldwide agricultural pest and invasive species that was first sighted in Barbados in 2000, and has since caused widespread damage to agriculture (Gibbs, 2012). In addition to attacking hundreds of different plant species, these land snails are a potential vector for transmitting diseases such as eosinophilic meningitis to humans by carrying the nematode *Angiostrongylus cantonensis*, which causes rat-lungworm. With a fast reproductive rate, the GAS has increased at an exponential rate over the past twelve years (Ministry of Agriculture, 2011).

Due to GAS's prolificacy in the landscape, Barbadians have a strongly negative perception towards the snails; crushed snails emit a foul odor, attracting flies, and they leave behind unsightly mucous trails and ribbon-like feces (Fields, 2006).

The Barbadian Ministry of Agriculture has worked hard to eradicate the GAS from the landscape, originally through distribution of metaldehyde and iron phosphate-based baits. It is recognized that methods of control involving molluscicide pose threats to human health and the environment. More recently, the Ministry has implemented a Bounty program. This Bounty program is now in its third year, and has received and destroyed over 264 tons of GAS (Ministry of Agriculture, 2011).

Objectives The goal of the Bajan Achatina team was to find an alternative method of snail control by firstly exploring the option of turning the GAS into an edible commodity to be consumed by the Barbadian tourist population, and secondly by determining its economic feasibility as a potential export product. This project included the following steps: (1) Raising the GAS for consumption; (2) Tenderizing and incorporating the GAS into 4 signature dishes using local and international recipes and cooking techniques; (3) Hosting a meal event at a local restaurant in order

to demonstrate that the *Achatina fulica* can be a delicious, nutritious and palatable source of food; (4) Exploring the feasibility of canning snails and establishing an export industry for Giant African Snail meat.

Snail Farming To raise the GAS, snail pens were constructed, and 25 kilograms of snails were ordered from the Ministry of Agriculture. There were two hutch boxes with two wooden pens in each, lined with loose, moist soil as suggested from research, and placed in a cool, wind and predator-protected location at the Bellairs Research Institute in Holetown (Cobbinah, 2008).



Figure 1: A hutch box, containing two snail pens. There are screens to prevent the snails from escaping, and to keep the pen dark and cool.

The snails were fed on chicken feed and organic matter from the Bellairs compost for approximately 4 days, then removed from the pens and put into a plastic container for a 1-3 day process of purging and starvation before they were suitable for consumption.

Preparation and Recipes The processing of the live snails into snail meat involves washing the snails, boiling them for 3 minutes to kill them, and removing the foot from the shell with tweezers (Cobbinah, 2008). The viscera is cut off and discarded so only the edible foot remains, and then these are pressure-cooked for 15 minutes to tenderize. In the last phase, the slime from the cooked snails is removed by rubbing alum stones



Figure 2: Boiled GAS

over the feet, and the snails are ready to be cooked, canned, or frozen for later consumption.

Two snail preparations were carried out between recipe-testing and before the meal event. In the first tenderization attempt, the snail meat was pressure-cooked for 20 minutes, which resulted in a very tender product. The second batch, used for the meal event, was cooked for 15 minutes, and as a result the snail meat took on a firmer, yet chewy consistency.

Bajan cuisine can be characterized by a flavourful mix of African, European, Indian, and Creole traditions, and recipes with a rich history and numerous ways of preparation (Eversley et al., 2011). In coming up with 4 snail dishes, it was decided that creating 3 Caribbean or Bajan-influenced dishes would not only appeal to the tourist market as a Bajan specialty, but it would incorporate locally-sourced ingredients that are unique to Barbados and the Caribbean. Popular Caribbean cooking methods, such as frying and barbecuing, were utilized in 3 recipes. The fourth recipe, the Escargot Bourguignon, is a French-style dish that represents one of the most well-known methods of cooking escargot. The recipes are as follows: Achatina Fritters with tamarind, rum, and muscovado sugar chutney dip; Stuffed Zucchini Boat; Jerk Snail; and Escargot Bourguignon.

Two test kitchens were conducted, the first one utilizing canned escargot from the supermarket to experiment with the 4 recipes. Adjustments were made to the dishes and the second test kitchen was carried out with the prepared *Achatina fulica*.



Figure 3: First test kitchen with the 4 recipes

Meal Event and Results The steps in farming and incorporating the cooked snails into 4 recipes cumulated in a meal event held at Relish Epicurea, a local restaurant (located at Limegrove mall, Holetown, in St. James), where the snail dishes were prepared and served, and the guests were surveyed on the palatability of

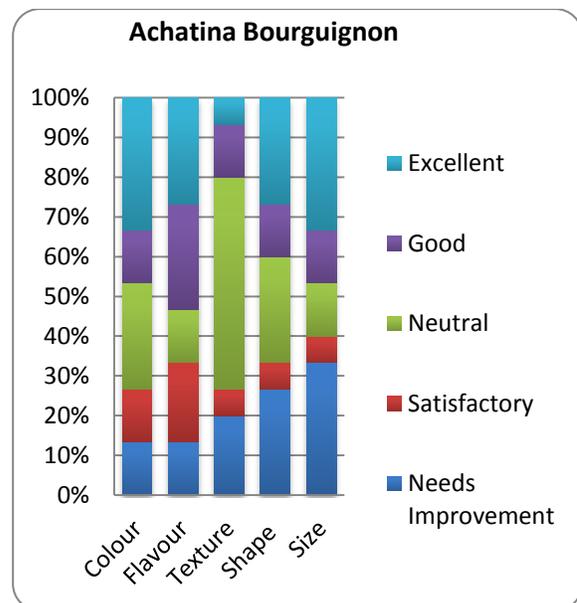
the 4 dishes and the taste of the GAS compared to the canned escargot.

Figure 4: Dishes served at Relish Epicurea.



Figure 5: Nathaniel, serving guests at the meal event.

In analysing the sensory evaluation surveys of the dishes, the Achatina Fritters and Stuffed Zucchini Boats had the highest ranking (on a scale of 1-5, with 5 being the best), achieving over 80% in all sensory categories, followed by the Jerked Snail and Bourguignon. The Jerked Snail was given positive acceptability ratings for the flavour, texture, shape and size yet the colour required some adjustments. Lastly, the texture of the GAS Bourguignon was evaluated as slightly tough and not tender enough, which may be improved by increasing the pressure-cooking time during preparation.



Business Analysis and Potential Economic Opportunities

In order to establish a business, a number of different factors had to be considered. Steps towards identifying the potential of the business included analyzing snail collection methods, designing a snail holding center, weighing the pros and cons of numerous packaging methods, designing a marketing plan, determining approximate sale prices, and organizing shipping and transportation methods. Upon collecting this data, market size and reach were assessed and it was determined that this business is feasible and potentially significantly profitable.

After the preliminary research had been done, the Ministry of Agriculture was contacted in order to ensure their support for the business. The business was discussed with Head Entomologist Mr. Ian Gibbs and Chief Agricultural Officer Mr. Ralph Farnum, and both believe it has the potential to significantly benefit Barbados due to both higher incentives for snail collection in combination with cost-saving measures for the Ministry. The two also believed that the business would qualify for certain subsidies, such as the *Land for the Landless* program offered by the Barbados Agriculture Development and Marketing Company.

Conclusion and Recommendations Owing to the generally great reception of the snail dishes from tourists and a few locals at the meal event, it can be concluded that not only is the *Achatina fulica* an edible source of food, cuisine incorporating its meat may be a potential area of interest for restaurants catering to the tourist population. Additionally, an analysis into the possibility of local sale and exportation of GAS shows that the idea of an economical business has definite potential. To conclude, exploration into environmentally friendly and economically beneficial methods of controlling the Giant African Snail population in Barbados is a promising direction for the future.



Figure 6: From left- Christie, Aileen, Asma, and head chef of Relish.

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