

# A survey of indigenous knowledge about food and medicinal properties of *Solanum torvum* in East Akim District of Eastern Region of Ghana

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## ABSTRACT

*Solanum torvum* is a popular plant in Ghana, especially among the Akan communities. It is believed that the plant has special properties of stimulating the production of blood cells and could be helpful in treating anaemia. A survey was carried out in 20 randomly selected communities in the East Akim District in the Eastern Region of Ghana to gather indigenous knowledge on food and medicinal properties of the plant. The respondents indicated that the plant had huge potential in controlling certain diseases, including malaria and cough. They also believed that the plant had certain properties that helped in producing blood cells. Nutritional analysis of the plant showed *S. torvum* to be a good source of iron, an essential element in haemoglobin production. However, further work needs to be done to verify the acclaimed properties of the plant.

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## Introduction

*Solanum torvum* belongs to the family Solanaceae, and it is believed to have originated from Central and South America, Mexico, Brazil through to Peru (PROTA, 2004). In West and Central Africa, it is grown as home garden crop. It also occurs in other regions of Africa. It is cultivated as a small-scale vegetable in southern and eastern Asia, and is especially popular in Thailand (PROTA, 2004). It is widespread in the Caribbean (PROTA, 2004). *Solanum torvum* is known by different names among the Akan communities in Ghana. It is known among the Akyems as “abedru” or “bedru”, the Kwahus as “kantose”, and the Ashantis as “kwahu nsusua”. Although the plant is mostly consumed by people in the rural communities, it is gaining importance in the peri-urban and urban centres of Ghana (Essiedu, 1985). The fruits are axillary, green, and about 1 cm in diameter; and are eaten either raw or cooked. The bitter fruit is

used in soups and sauces, or is chopped together with eggplant fruits or tomatoes.

*Solanum torvum* is also used in traditional medicine. Its fruits and leaves can be used to control a wide range of microbial activities (PROTA, 2004). The antimicrobial properties of the leaves have been known for some time in Central America and India, and in Gabon where people apply the leaves to cuts and wounds (PROTA, 2004). In Sierra Leone, the fruit is used as cough medicine for children; whereas in Senegal, it is used to treat sore throat and stomach ache. The glycoalkaloid solasodine that is found in its leaves and fruits is used in India to manufacture steroidal sex hormones for oral contraceptives. In India, the leaves are dried and ground to powder and used as medicine for diabetic patients (PROTA, 2004).

The leaf is also used in treating coughs; and a sedative, diuretic, and digestive tonic

(Tackie, 1959).

The roots of *S. torvum* are used for poulticing cracks in the feet in Malaysia, or as an antitussive in China where the roots are believed to disperse extraverted blood and to relieve pain (PROSEA, 1993). The seeds are smoked in Malaysia and used to cure toothache. Extracts of the plant are used as an antidote to snakebite and insect stings in India, while the leaves and fruits are eaten to relieve stomach pain (PROSEA, 1993). *Solanum torvum* is sometimes used as rootstock for tomato in Brunei to resist bacterial wilt, and for eggplant in Japan and Trinidad (PROSEA, 1993).

*Solanum torvum* is a pantropical weed common along the roadside and in waste places after soil disturbance. It prefers moist, but not too wet places, and occurs up to 1600 m altitude (PROSEA, 1993).

Essiedu (1985) analyzed the chemical composition of *S. torvum* and reported that the plant was rich in protein, fat, crude fibre, and some essential minerals such as iron, calcium, sodium, potassium and phosphorus. It also contained some carbohydrates, provitamin A (B-carotene) and vitamin C (ascorbic acid), and glycoalkaloids that have medicinal functions. However, the glycoalkaloids are considered toxic when their levels exceed 2.8 mg kg<sup>-1</sup> body weight of solanin.

In another experiment, Serfor-Armah, Fletcher & Opong (2005) determined some essential elements in the fruits of *S. torvum*, using neutron activation analysis. They found that the iron content of the plant was about 17 times more than the value found in solanum fruits. The high values of iron concentration in *S. torvum* make it unique among other species of eggplant. Serfor-Armah *et al.* (2005) found that all the electrolytes that are constituents of blood plasma (including K, Ca, and Mg) were also present in *S. torvum* in substantial amounts. For every 100 g of *S. torvum*, the elemental concentrations were potassium (1290 mg), calcium (1016 mg), and magnesium (1313.65 mg). They concluded that *S. torvum* was a good source of iron and could lead to the production of more haemoglobin cells when

eaten regularly. This may lead to improvement in the quality of blood.

Owing to the rapidly emerging importance of traditional medicine and the claims that *S. torvum* can cure many diseases, the study aimed to gather indigenous knowledge on medicinal uses of the plant to authenticate the claims and document them for posterity.

#### Materials and methods

The East Akim District of the Eastern Region of Ghana was surveyed in 2007. Twenty communities were randomly selected from a list of communities in the district. The towns were Adadientem, Agyapomaa, Akyem Adukrom, Akyem Apapam, Akwadum, Anyinasin, Apedwa, Asafo, Asiakwa, Bunso, Ettukrom, Fisher, Maase, Nobi, Old Tafo, Osiem, Potroase, Kibi, Kukurantumi, and Wrenkyiren Amanfrom (Fig. 1).

In all 332 people comprising 120 men and 212 women, were interviewed using questionnaires administered by the researcher, because some people could not read or write. Questions that were asked ranged from name of respondent, age, gender, knowledge of the plant, medicinal and food properties to mode of cultivation.

#### Results and discussion

All the people interviewed indicated that they consumed *S. torvum*. Asked whether the plant was cultivated, they responded in the negative. The plant grows wildly and birds are the main agents of dispersal. The respondents claimed that birds, especially common bulbul (*Pycnonotus barbatus*) locally known as "apatupre", prefer *S. torvum*.

The information gathered from the interviewees indicated that various parts of the plant are consumed or used for many food and medicinal purposes (Table 1). Most (52%) respondents used the fruits. The plant may be used in preparing stews. It can also be used, together with palm fruits, to prepare soup, which is believed to boost the haemoglobin counts of

consumers, confirming the report by Sefor-Armah *et al.* (2005). In explaining the reason for the boost in haemoglobin counts, Sefor-Armah *et al.* (2005) indicated that K, Ca and Mg (which are constituents of blood plasma) were found to be present in substantial amounts in *S. torvum*.

The respondents also claimed that the fruits, when used to prepare palm nut soup for pregnant women, help enhance the proper development of the foetus.

TABLE 1  
*Plant Parts Used by Respondents*

<i>Plant part used</i>	<i>Frequency</i>	<i>Percentage</i>
Fruits	173	52.00
Leaves	96	29.00
Fruits and leaves	63	19.00
Total	332	100.00

The medicinal benefits of the plant, according to the respondents, were enormous. Thirty-one percent cited cure of malaria from drinking boiled leaves. Table 2 shows that 22 and 21 per cent of the respondents used the plant to treat common cold and cough in children and adults respectively. Water extract from the fresh leaves, when slightly warmed, is used as syrup for cough or inhaled to cure common cold. The plant is used for various medicinal purposes in several countries. For example, in Senegal the leaves are used to cure sore throat and stomach ache; and in Malaysia, people use the leaves to cure stomach pain (PROSEA, 1993). In India, the leaves are used to treat diabetes (PROTA, 2004).

The fresh leaves were reported (4% of the respondents) to be used in treating ring worm disease (locally known as "kakawirewire"). The leaves are ground together with *Xylopiya ethiopica*, locally known as "hwentia", to treat the disease. Some respondents (2.6%) claimed that water extracts from the leaves can also be used to cure sinuses, locally referred to as

"kokoram". Some respondents used the leaves to cure two or more diseases (Table 2).

Information gathered from Centre for Scientific Research into Plant Medicine indicated that *S.*

TABLE 2

<i>Diseases Respondents Used Plant Parts to Treat</i>		
<i>Type of disease</i>	<i>Frequency</i>	<i>Percentage</i>
Malaria	103	31.00
Common cold	73	22.00
Cough	70	21.00
Ringworm	13	4.00
Sinuses	7	2.00
Malaria and common cold	43	13.00
Malaria and cough	10	3.00
Common cold and cough	10	3.00
Malaria, common cold and cough	3	1.00
Total	332	100.00

*torvum* is a useful medicinal plant that is recommended in managing malnutrition and anemia in children. It added that the fruits, when consumed by pregnant women, help in the proper development of the foetus; also, adults can use the plant as a health tonic. The source confirmed further that no negative effects had so far been associated yet with the use of the plant, and as such it was safe (Edwin O. Lartey, personal communication).

It seems the medicinal properties and nutritional value of *S. torvum* are well known among the respondents, and as a result it is used as the first line of treatment against some common diseases.

Essiedu (1985) investigated the chemical composition of *S. torvum* and reported that the plant contains a lot of iron, which enhances erythropoiesis (red blood cell formation) or vitamin B complex. The plant's nutritional value and medicinal uses to improve on haemoglobin level was also confirmed by a source at the District Health Directorate (Ms Jennifer Ampem,

personal communication).

*Solanum torvum* plays an important role in the lives of the communities visited. According to the respondents, the plant forms an integral part of their diet and it is used in all the stews and soups. The respondents claimed that the plant had gained popularity in recent times because urban dwellers who visited the communities patronized the plant.

Another important observation is that the plant was seen growing in almost all the homes that were visited in the community, indicating that they cherish the plant.

#### Conclusion

The study indicated a huge potential for the adoption of the crop. Therefore, more research is recommended on the plant, especially on the medicinal aspects, to find out the authenticity of some claims associated with the plant. The plant should be domesticated and integrated into the farming systems to conserve the species.

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