GGTP levels in the groups treated with silymarin and ethyl acetate extract of *S. brevistigma*. The enzyme levels were almost restored to the normal.

It was observed that the size of the liver was enlarged in CCl₄-intoxicated rats but it was normal in drug-treated groups. A significant reduction ($P < 0.001$) in liver weight supports this finding.

It was found that the extract decreased the CCl₄-induced elevated levels of the enzymes in group third and fourth, indicating the production of structural integrity of hepatocytic cell membrane or regeneration of damaged liver cells by the extract.

Histopathological examination of the liver section of the rats treated with toxicant showed intense centrilobular necrosis and vacuolization. The rats treated with silymarin and extracts along with toxicant showed sign of protection against these toxicants to considerable extent as evident from formation of normal hepatic cells and absence of necrosis and vacuoles.

Decrease in serum bilirubin after treatment with the extract in liver damage indicated the effectiveness of the extract in normal functional status of the liver. The preliminary phytochemical studies revealed the presence of flavonoids in ethyl acetate extract of *S. brevistigma*; various flavonoids have been reported for their hepatoprotective activity. So the hepatoprotective effect of *S. brevistigma* may be due to its flavonoid content.


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**Plasmodium ovale**: First case report from Assam, India

The most prevalent species of human malaria parasite reported in India is *Plasmodium vivax* accounting for nearly 65% cases in the country followed by *Plasmodium falciparum* contributing about 35% malaria case load and *Plasmodium malariae* with only a few thousands cases recorded from few foothill areas in Orissa state. Occurrence of *Plasmodium ovale*, the fourth malaria parasite species, has not been very common in India and till date only three reports of *P. ovale* are available from Kolkata, Orissa and more recently from Delhi. Here we report the finding of a case of *P. ovale* from Jorhat district of Assam, which is the first from the northeastern region of India.

During our longitudinal malaria epidemiologic investigation (April 2001–October 2002) in a village under Titabor Primary Health Centre of Jorhat district, the blood smear from ‘GT’, a 28-year-old male, was collected on 17 February 2002 by the surveillance worker during routine active case detection visit in that village. At the time of blood smear collection the patient gave the history of intermittent high fever for the past 4–5 days accompanied by chill and rigor, bodyache and vomiting. He was administered presumptive treatment of 600 mg chloroquine after collecting the blood smear. The blood smear was stained with JSB (Jaswant Singh & Bhattacharya) stain and examined on 22 February 2002 in the field laboratory. The smear was positive for malaria parasite which looked like *P. vivax* in thick smear at first glance. However, careful examination of thin smear revealed it as *P. ovale* on the basis of specific morphological characteristics. Many infected red blood corpuscles were oval in shape, some were fronded on one or both ends with heavy coarse Schuffner’s stippling even in early trophozoite stage. The cytoplasm of the growing parasite was thick, compact and usually not amoeboid (Figure 1) and schizonts had 7–8 merozoites. All these features of the parasite and infected RBCs were confirmatory for *P. ovale*. Subsequently, the identification of *P. ovale* was confirmed at Faculty of Tropical Medicine, Mahidol University, Bangkok and at Wellcome-Mahidol University-Oxford Tropical Medicine Research Unit, Bangkok. On 23 February 2002, the patient was clinically examined, a follow-up slide was taken and treated radically with 1200 mg chloroquine and 75 mg primaquine (15 mg × 5 days). The moderately anaemic patient during clinical examination was found with resolved symptoms. His liver was unpalpable whereas the spleen was soft, tender and one finger enlarged. No malaria parasite was seen in the follow-up slide, indicating that the patient responded positively to the 600 mg presumptive treatment of chloroquine. The patient was followed up at fortnightly intervals until October 2002 during which he was neither found to suffer from any febrile episode of fever nor was presence of malaria parasite detected in blood smears.
SCIENTIFIC CORRESPONDENCE

Figure 1 a–c. Photomicrographs of infected red blood corpuscles with growing trophozoites of *P. ovale* as seen in thin smear under oil immersion lens (× 1000).

The study village situated at the foot of forested Naga Hills on Assam–Nagaland border is highly endemic for malaria. The patient with *P. ovale* infection was a daily wage earner, who never moved out of district Jorhat during his life time. However, he occasionally visited the adjoining Naga hills for collection of fire wood, jhum cultivation, log cutting, etc. Since our ½ years of investigation we detected only one case of *P. ovale*, the chances of indigenous transmission of *P. ovale* in the study village seemed remote and the patient most likely contracted this infection in Nagaland during one of his visits to the Naga hills. The chances of *P. ovale* transmission in Myanmar bordering Nagaland state are relatively higher since wide distribution of *P. ovale* is on record from Myanmar. However, this assumption needs confirmation.

*P. ovale*, frequently confused with *P. vivax*, causes mild malaria and is hardly fatal. Due to its rarity, *P. ovale* infection, at present, does not pose a public health problem in India. However, if remained undiagnosed or underdiagnosed due to it being confused with *P. vivax*, this may spread to more foci causing malaria morbidity problem in future. The present finding of *P. ovale* and a recent case report of *P. malariae* from Kamrup district of Assam indicate that, besides *P. falciparum* and *P. vivax*, these two species of human malaria parasite are also present, though very few in number, in the northeastern region of India. Proper population-based surveys using molecular tools, particularly in international border areas, could throw light on the magnitude of prevalence of these relatively rare parasite species in this region.


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Fossilized elephant bones in the Quaternary gypsum deposits at Bhadawasi, Nagaraur district, Rajasthan

We report here fossilized remains of an elephant discovered in a gypsum bed during its mining at Bhadawasi village in Nagaraur district of western Rajasthan. The skeletal remains were embedded within the Quaternary gypsum below a sand cover of about 2.6 m. Fossil remains collected include: a part of femur, proximal head of femur, a piece of tibia, a large fragment of scapula, one of the vertebrae – probably a lumbar and many pieces of broken ribs. These findings suggest forested conditions along a river (Vedic Sarasvati) at the time. Presently the region is occupied by the Thar Desert.

Fossilized bones of a large mammal were discovered recently in the gypsum bed of the Quaternary age at Bhadawasi village (27°14′ : 73°40′) located about 20 km from Nagaraur town on the Nagaraur–Bikaner road (Figure 1) during the mining of gypsum. The gypsum mine (Figure 2) in which the remains were found is about 2–3 m deep and is located in the land of Adu Ram, a local farmer. This is the first report of the presence of fossil remains of a large mammal in the