

***Arctium lappa* - Burdock pappus bristles can cause skin irritation and burdock ophthalmia**

Contact with and handling of burs (the flowering heads or infructescences) from the greater burdock (*Arctium lappa* L., Asteraceae) and other members of the same genus, is a potential hazard for humans, horses, and dogs. The minute, sharply-pointed, bristly pappus hairs easily detach from the top of the 'seeds' and are carried by the slightest breeze - attaching to skin, mucous membranes, and eyes where they can cause severe dermal irritation, possible respiratory manifestations, and ophthalmia.

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Burdock is a widespread ruderal weed throughout the northern temperate zone. Burdock root is commonly eaten in Japan (ゴボウ "gobo"), China (牛蒡 "niúbàng"), and Korea (우엉 "ueong") and extensively grown and cultivated there. Today, in these countries, shredded freeze-dried burdock root is popularly eaten in soups and many other dishes.

Most members of the tribe Cardueae in Asteraceae bear a ring of more or less barbed pappus hairs or bristles at the top of the developing 'seeds'. These seem to serve the purpose of defense against possible intruding insects (plant-feeding bugs as by our observation) probing from the top of the bur towards the seeds.

In the course of collecting larger amounts of burdock 'seeds' (actually: single-seeded fruits called achenes, originating from many flowers surrounded by involucre leaves) for a research project, we became afflicted with a discomforting skin and eye irritation which none of us could initially attribute to any associated agent. A possible suspect could have been chiggers (harvest mite larvae of the Trombiculidae). However, in removing the seeds from the dried burs we noticed large amounts of minute yellow 'chaff' that separated in the seed-extraction and sifting process. This fine material had a noticeable aggregating property which did not seem to be due to any gummy or resinous substance. We started to become curious about the morphology and microscopically investigated the associated structures.

A first simple light microscopic preparation revealed the barbed nature of these structures, later confirmed and more clearly revealed by scanning electron microscopy (Figs. 1–3). Obviously these pappus hairs were to be held responsible for the encountered symptoms. The possible hazard of these pappus bristles has variously been reported in the literature as **burdock ophthalmia** (nodular conjunctivitis, ulcerative/non-ulcerative keratitis) in humans, but also in a veterinarian context regarding horses and dogs (1–6).

It is advisable to stay clear from mature burdock plants in the wild, to refrain from playing with mature burs, and using according protective gear when cutting or harvesting the plants in gardening settings or in the agricultural domain to avoid contact and potential harm from the minute barbed pappus bristles contained within mature burs.

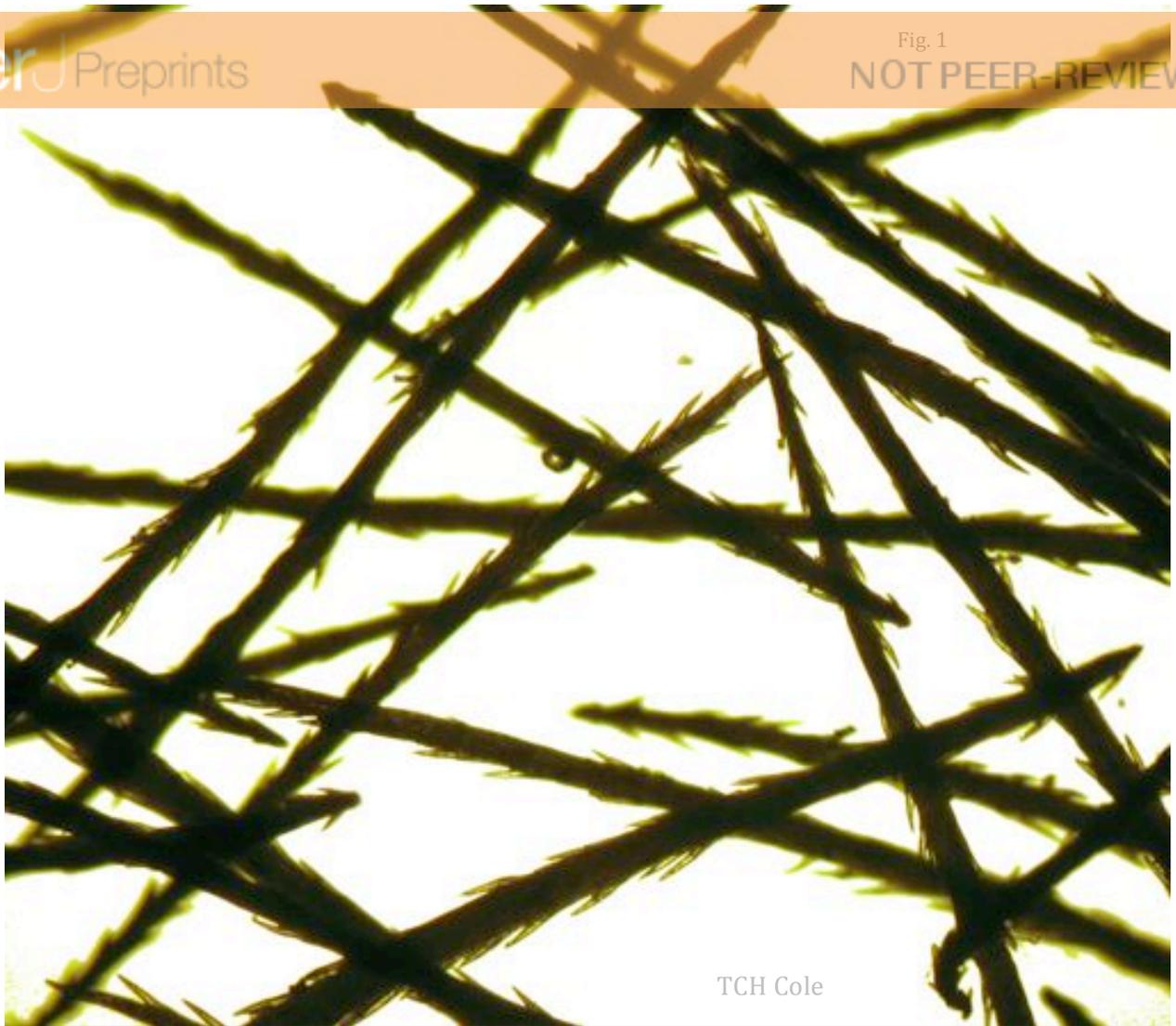
- (1) Munk CE (1926) Injuries to the conjunctiva by spines from the common burdock. *Am J Ophthalmol* 9(7):507–510
- (2) Miklos A (1931) Klettenconjunctivitis. *Klin Wochenschr* 10(33):1555
- (3) Havener WH, Falls HF, McReynolds WU (1955) Burdock bur ophthalmia. *AMA Arch Ophthalmol* 53(2):260–263
- (4) Breed FB, Kuwabara T (1966) Burdock ophthalmia. *Arch Ophthalmol* 75(1):16–20
- (5) Pickett JP, Crisman MV, Furr MO (1993) Conjunctival foreign body (burdock pappus) induced keratitis in horses: 10 cases. *J Equine Vet Sci* 13(2):88–91
- (6) Foster CS, Vitale AT (2013) *Diagnosis and Treatment of Uveitis*, 2nd edn. Jaypee, New Delhi/London

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TCH Cole

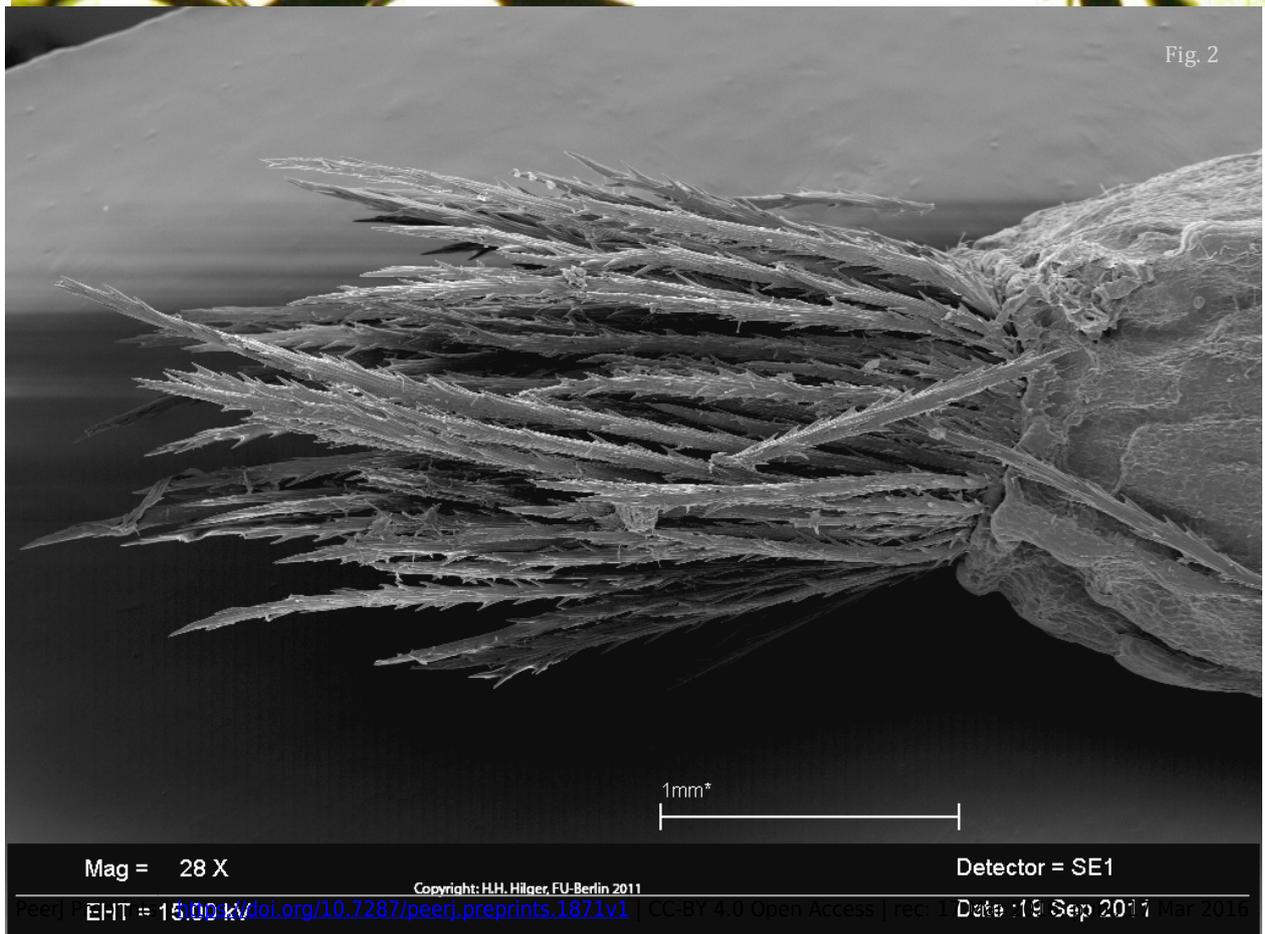


Fig. 2

1mm*

Mag = 28 X

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Detector = SE1

Fig. 3

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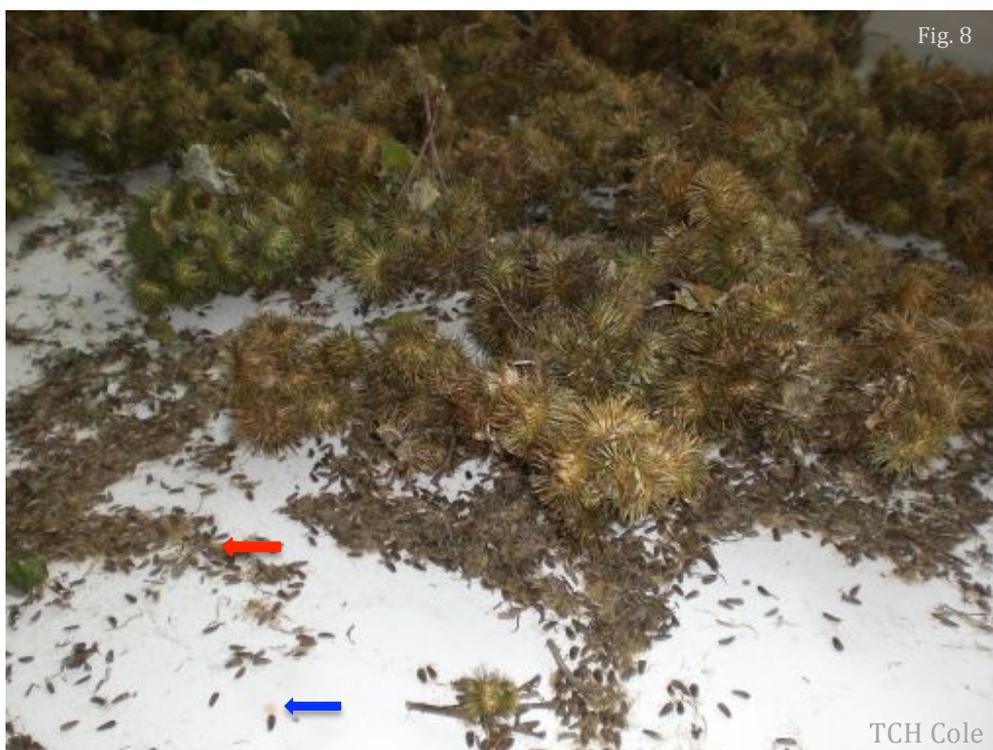
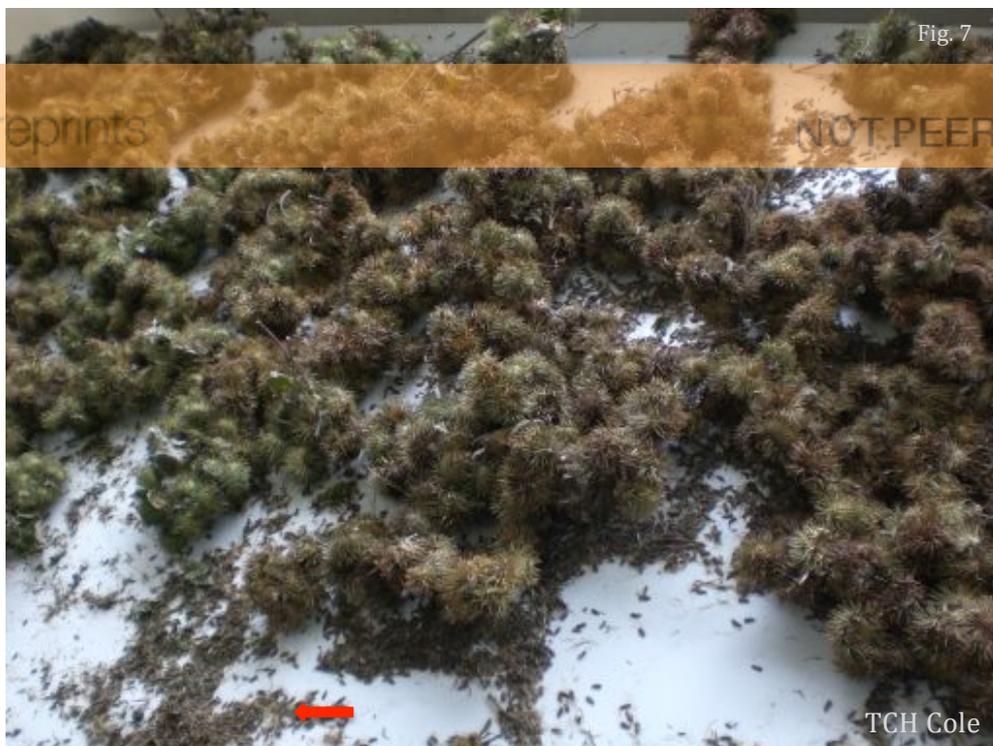


Figure legends

Fig. 1. LM of barbed pappus bristles

Fig. 2. SEM of pappus bristles

Fig. 3. Longisection of fruiting *Arctium* head;
red arrow points to pappus bristles; incurved tips of involucre bracts act as "velcro" hooks

Fig. 4. Bulldozered entire, mature plants incl. tap roots

Fig. 5. Blooming plant with immature burs

Fig. 6. Freshly cut fruiting heads
(*red arrow* indicates chaffy pappus hairs)

Figs. 7 & 8. Dried flowering heads
(*red arrows* point to aggregations of pappal bristles; *blue arrow* points to the crown of pappus

