OLYMPUS LB OBJECTIVES - TEST

Anthony Thomas New Brunswick, Canada

I recently had the need to check the image quality of some Olympus objectives, namely: S Plan FL 2X (NA 0.08), D Plan 4X (NA 0.1), S Plan Apo 10X (NA 0.4), S Plan Apo 20X (NA 0.7), S Plan Apo 40X (NA 0.95). I needed a subject big enough to be seen with the 2X and with enough fine detail to benefit from a 40X objective. I selected a flea.

The microscope setup:

Trinocular Olympus BH2/BHS with a 1.25X Intermediate Tube (not needed for this test but left on the stand for DIC imaging); a NFK 2.5X Projection Eyepiece, a Phototube for connecting a camera to the microscope and a Nikon D810 full-frame DSLR.

Two Olympus substage condensers were used: a BH2-ULC , recommended for 1X-4X objectives; and a BH2-CD recommended for 4X-100x . I prefer and use the BH2-ULC for 4X objectives.

For initial alignment and focussing the built-in 12v 100 watt halogen lamp was used but for photographing this lamp was replaced with a Nikon flash controlled remotely by the D810.

Olympus BH2-ULC (Ultra Low Condenser) and BH2-CD (Abbe Condenser).

Flash setup. Cover for the Halogen Lamp Housing (BHS-LSH) removed leaving the 100 watt bulb in its original position. This bulb used for initial focussing. For imaging this bulb OFF and Nikon flash ON, Flash controlled remotely by the D810.

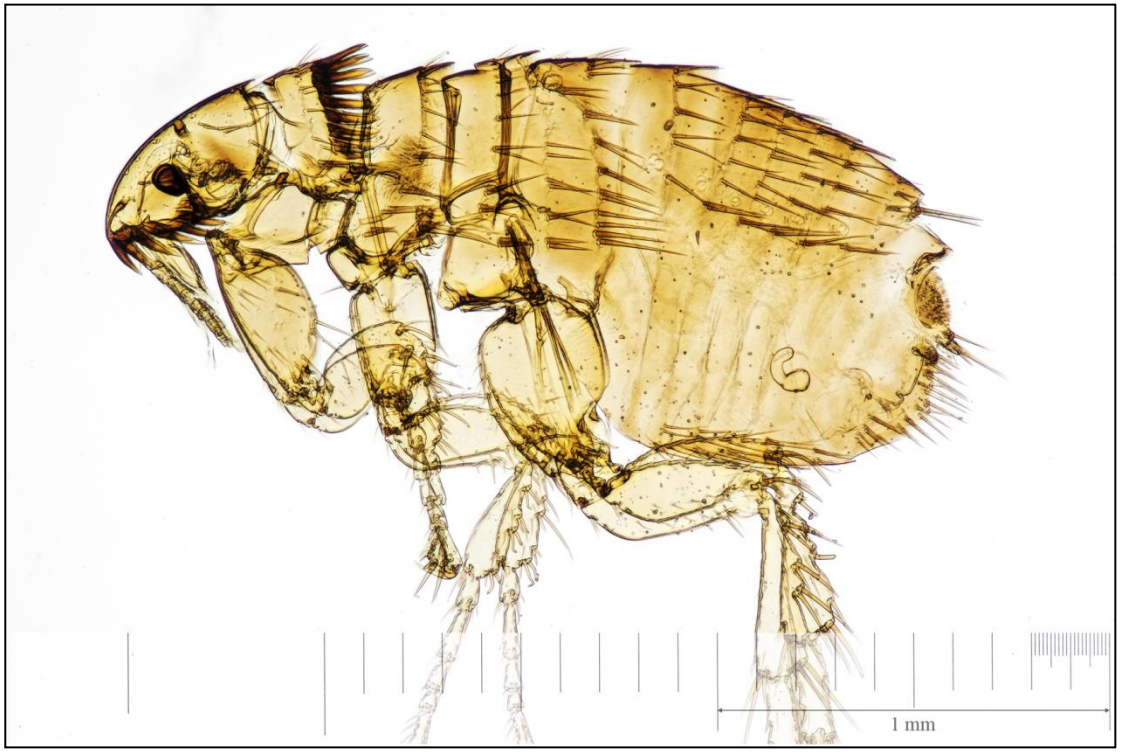
Magnifications

Because of the added lenses within the BHS the nominal magnification of the objectives was increased 3.125X (1.25x2.5). Thus, the 2X became 6.25X, the 4X became 12.5X, the 10X = 31.25X, 20X=62.5X, and the 40X=125X.

A consequence of these magnifications was that the camera's sensor width (36 mm) was reduced by the respective magnification factor.

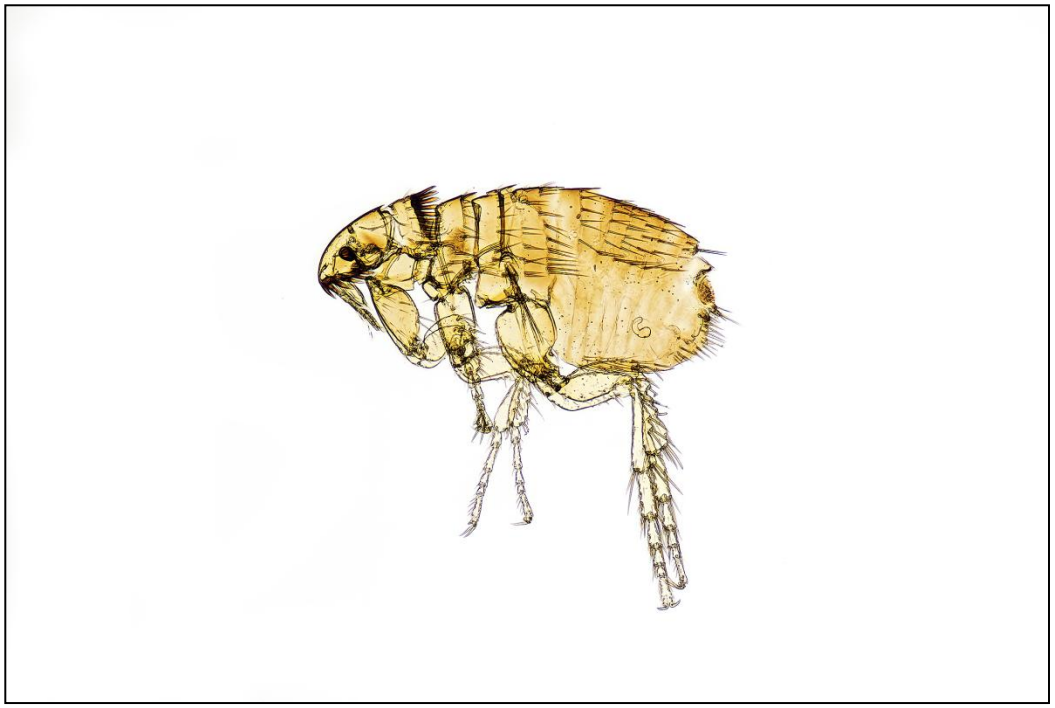
For example, with the 4X objective the flea's length (2.16 mm) was magnified 12.5x and filled much of the 2.88 mm frame (36/12.5).

[*In summary, Olympus S Plan Apo objectives produce excellent images*].

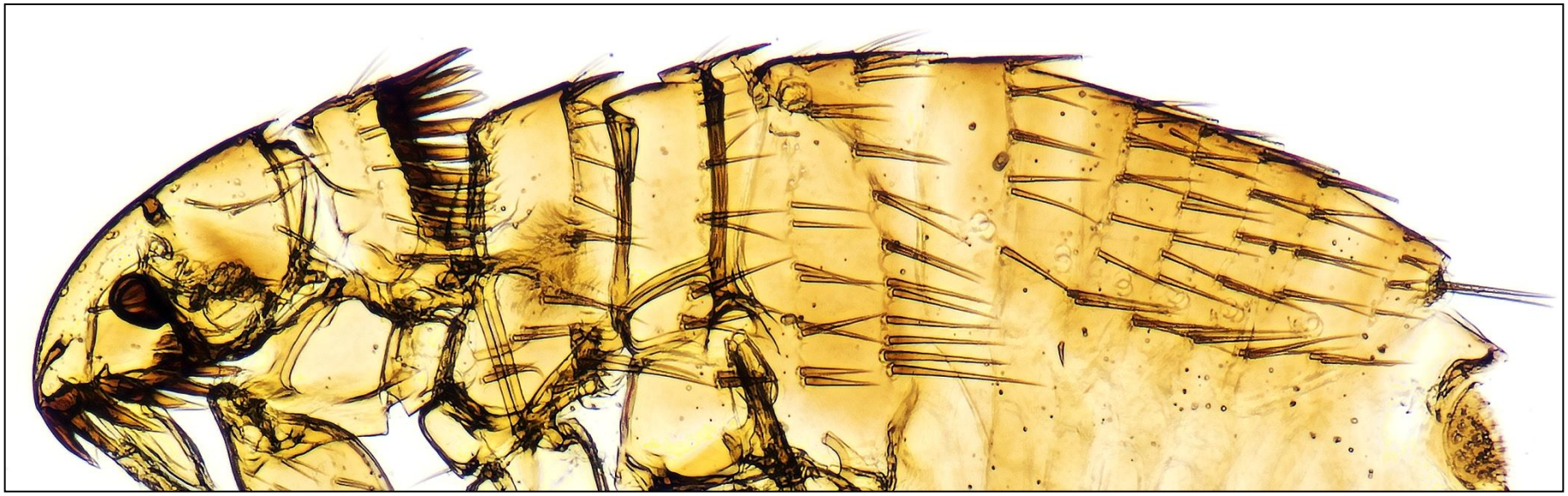


Flea, 4X objective (12.5X magnification) on the camera's full frame sensor (36 mm wide).

The 2X objective (actual magnification 6.25X) showed the entire flea and was useful for orientation . The image quality was excellent as can be seen from an enlarged crop.



Flea, 2X objective (6.25X magnification) on the camera's full frame sensor (36 mm wide).

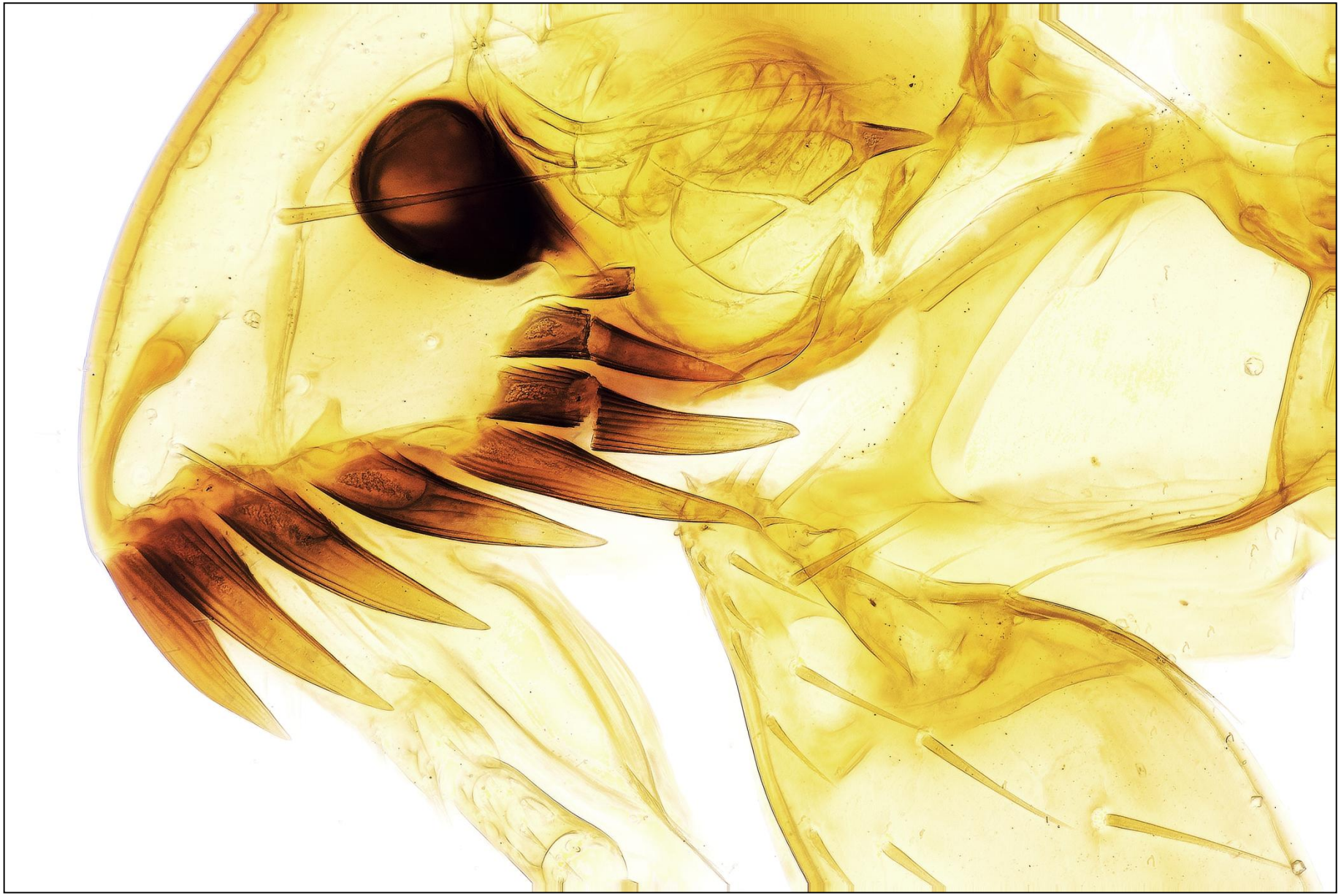


Flea, 2X objective (6.25X magnification), crop and enlargement of top image.

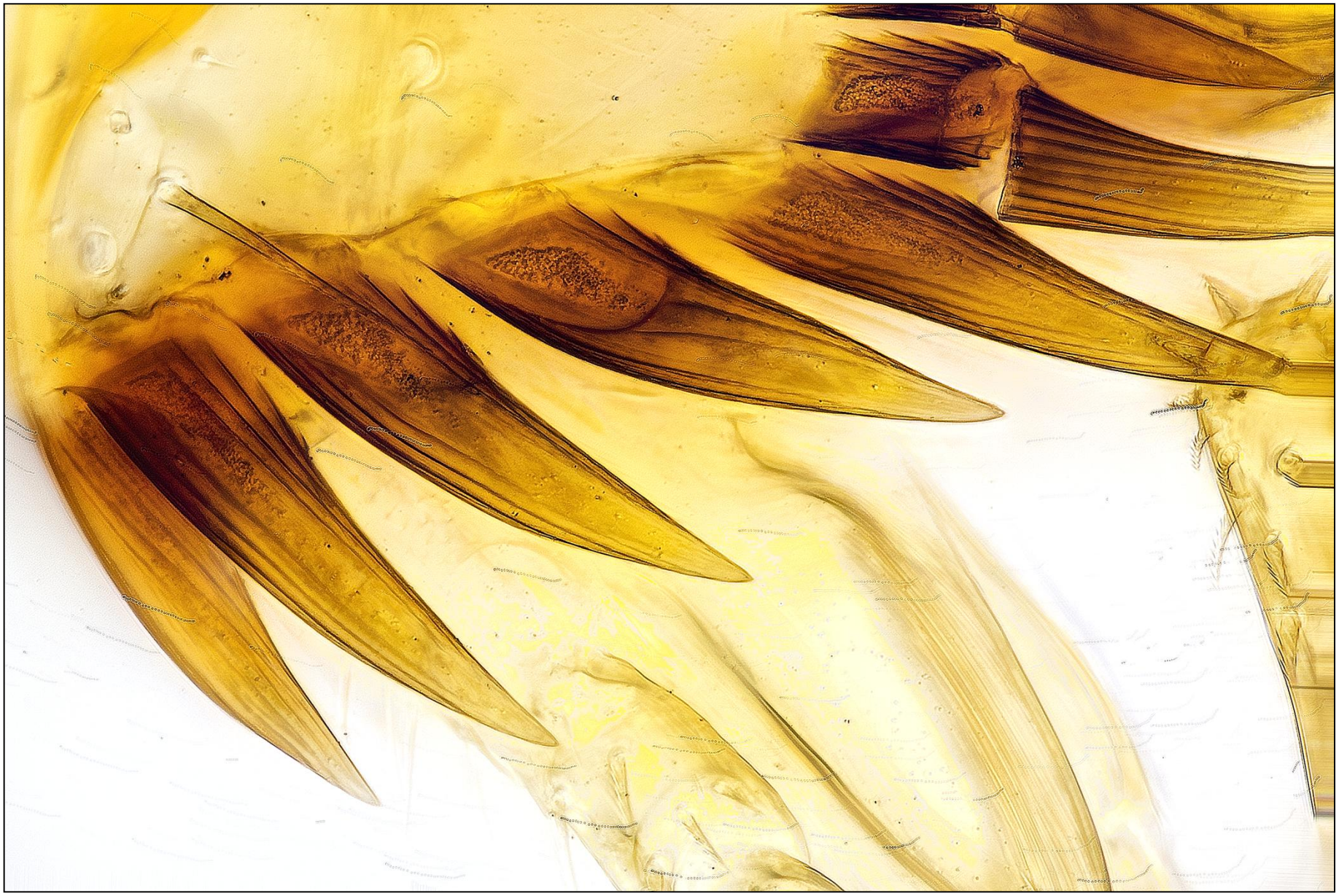
With the 10X, 20X, and 40X objectives image quality was excellent; but with progressively decreasing subject area.

Flea, 10X objective (31.25X magnification) on the camera's full frame sensor (36 mm wide).

Flea, 20X objective (62.5X magnification), detailed structure of the spines forming the genal comb show the external striations and an inner core in the broken spine



Flea, 40X objective (125X magnification), detailed structure of the spines forming the genal comb become even better defined.



Published in the November 2024 issue of *Micscape* magazine.