



Correspondences

Detailed visualization of *Demodex* mites by Dylan staining

To the Editor

Demodex mites are commensal microorganisms ubiquitously present in the pilosebaceous units of human skin [1]. A study of consecutive biopsies revealed *Demodex* mites in 10% of all biopsies and 12% of all follicles [2]. Their prevalence increases with age, and males are more heavily infested than females [2]. Although the mite's potential pathogenicity remains elusive, an increased *Demodex* population is associated with some skin and ocular disorders such as rosacea, pityriasis folliculorum, and blepharitis [1]. Severe infestation may occur in immunocompromised hosts [1].

There is an association between histologic folliculitis and the presence of *Demodex* in the follicles: mites have been found in 42% of inflamed follicles but only 10% of noninflamed follicles; 83% of follicles containing *Demodex* show inflammation [3]. Histological identification of *Demodex* mites is usually easy under hematoxylin and eosin staining when a large area of a mite's body is cut (Fig. 1A). However, it is difficult to conclude the presence of *Demodex* when only a small part of a mite's body is sectioned.

When we checked for amyloid deposition by using conventional

Dylon staining [4,5], we coincidentally found that *Demodex* mites were also positively stained (Fig. 1B). As the Dylon positivity of *Demodex* has not been reported in the literature, we compared the intensities of staining of *Demodex* mites with Dylon, periodic acid–Schiff, elastica van Gieson, Masson's trichrome, alcian blue, toluidine blue, and Grocott stain by using paraffin-embedded sections of facial eczema, rosacea, and senile sebaceous hyperplasia. *Demodex* mites were not stained with elastica van Gieson, Masson's trichrome, alcian blue, toluidine blue, or Grocott stain. Periodic acid–Schiff staining gave a positive result for *Demodex* mites, especially their inner structures than outer surface (Fig. 1C). Unlike with periodic acid–Schiff staining, with Dylon staining the surface of the mite—not the inside structures—was outlined (Fig. 1D–I). Periodic acid–Schiff gave a high level of background staining, because it also stained sebum debris, bacterial colonies, *Malassezia*, glycogens, basement membranes, and collagen fibers (Fig. 1C). In contrast, there was virtually no background staining with Dylon, so that it distinctively delineated the contours of *Demodex* mites, and even their fine surface structure (Fig. 1D–I). Dylon staining may be a useful tool for identifying the minute details of *Demodex* mites.

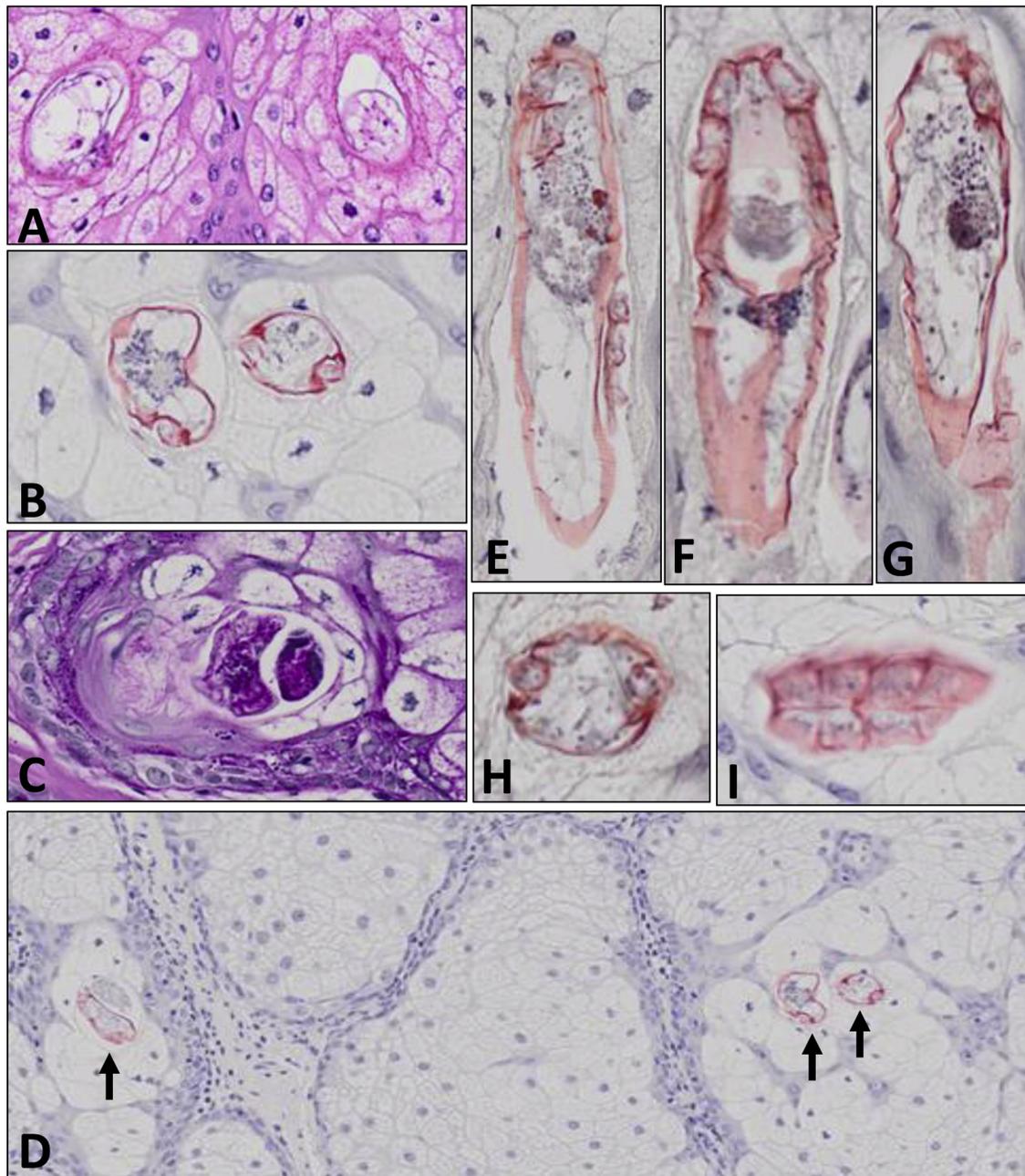


Fig. 1. High-power views of *Demodex* mites under hematoxylin and eosin (A), Dylon (B, D–I), and periodic acid–Schiff (C) staining. Even at low magnification, Dylon staining delineates the outer surface of *Demodex* mites (arrows) (D). The fine surface structures of *Demodex* mites are outlined by Dylon staining (E–I).

Conflicts of interest

The authors have no conflicts of interest to declare.

References

- [1] C.A. Elston, D.M. Elston, *Demodex* mites, *Clin. Dermatol.* 32 (2014) 739–743.
- [2] R. Aylesworth, J.C. Vance, *Demodex folliculorum* and *Demodex brevis* in cutaneous biopsies, *J. Am. Acad. Dermatol.* 7 (1982) 583–589.
- [3] R.T. Vollmer, Demodex-associated folliculitis, *Am. J. Dermatopathol.* 18 (1996) 589–591.
- [4] T. Yoshino, S. Ohara, H. Moriyama, Occlusive dressing therapy using dimethyl sulfoxide in a patient presenting with primary localized amyloidosis of the urinary bladder: a case report, *J. Med. Case Rep.* 7 (2013) 191.
- [5] H. Mukai, H. Eto, S. Nishiyama, K. Hashimoto, Differential staining of skin-limited amyloid and colloid bodies with immunofluorescence after pretreatments, *J. Invest. Dermatol.* 90 (1988) 520–525.

Kazuhisa Furue

Department of Dermatology, Kyushu University, Fukuoka, 812-8582, Japan

Mihoko Furue

Fukuoka, Japan

Masutaka Furue*

Department of Dermatology, Kyushu University, Fukuoka, 812-8582, Japan

E-mail address: furue@dermatol.med.kyushu-u.ac.jp.

* Corresponding author.