Morphology of Fat Bloom in Chocolate

Sir:

To date, it has generally been accepted that visual fat bloom in chocolate is cocoa butter that has separated toward the surface (1–4). In recent years, however, another type of visual fat bloom has been reported (5,6) that is formed as a result of a lack of balance in the fat content, leading to color lightening in phases with a low fat content. This fat bloom occurs as a result of solidification in the absence of seed crystals, e.g., without tempering. Figure 1 is an optical microscopic image of the surface of a chocolate sample that shows both the separation of fat toward the surface (the previously known type of bloom), and partial color lightening resulting from unbalanced fat content (the recently reported type of bloom). The sample was prepared from dark chocolate, which contains cocoa butter as the only fat, that was stored at 20°C for 1 mon after it had been prepared using a mold without tempering. Bloomed samples (6) with unbalanced fat content were subsequently stored at 27°C to develop further bloom caused by the separation of fat toward the surface. The white protrusions through the surface are idiomorphically crystallized fat, and the light brown-looking base is the phase with lower fat content. To date, visual fat bloom has been described in terms of the separation of fat toward the surface as a whole. This image, however, demonstrates that different types of bloom can co-exist. It also clearly shows that, owing to a low fat content, no separation of fat toward the surface has occurred in the light-colored phase.

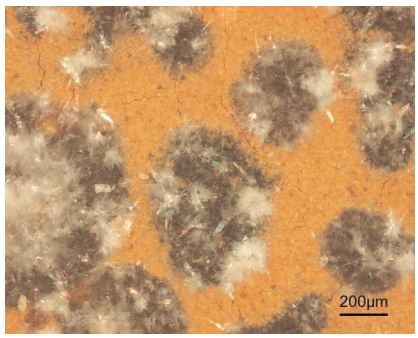

FIG. 1. An optical microscopic image of the surface of a bloomed chocolate sample obtained by storing at 20°C after preparing using a mold without tempering, followed by storage at 27°C.

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