

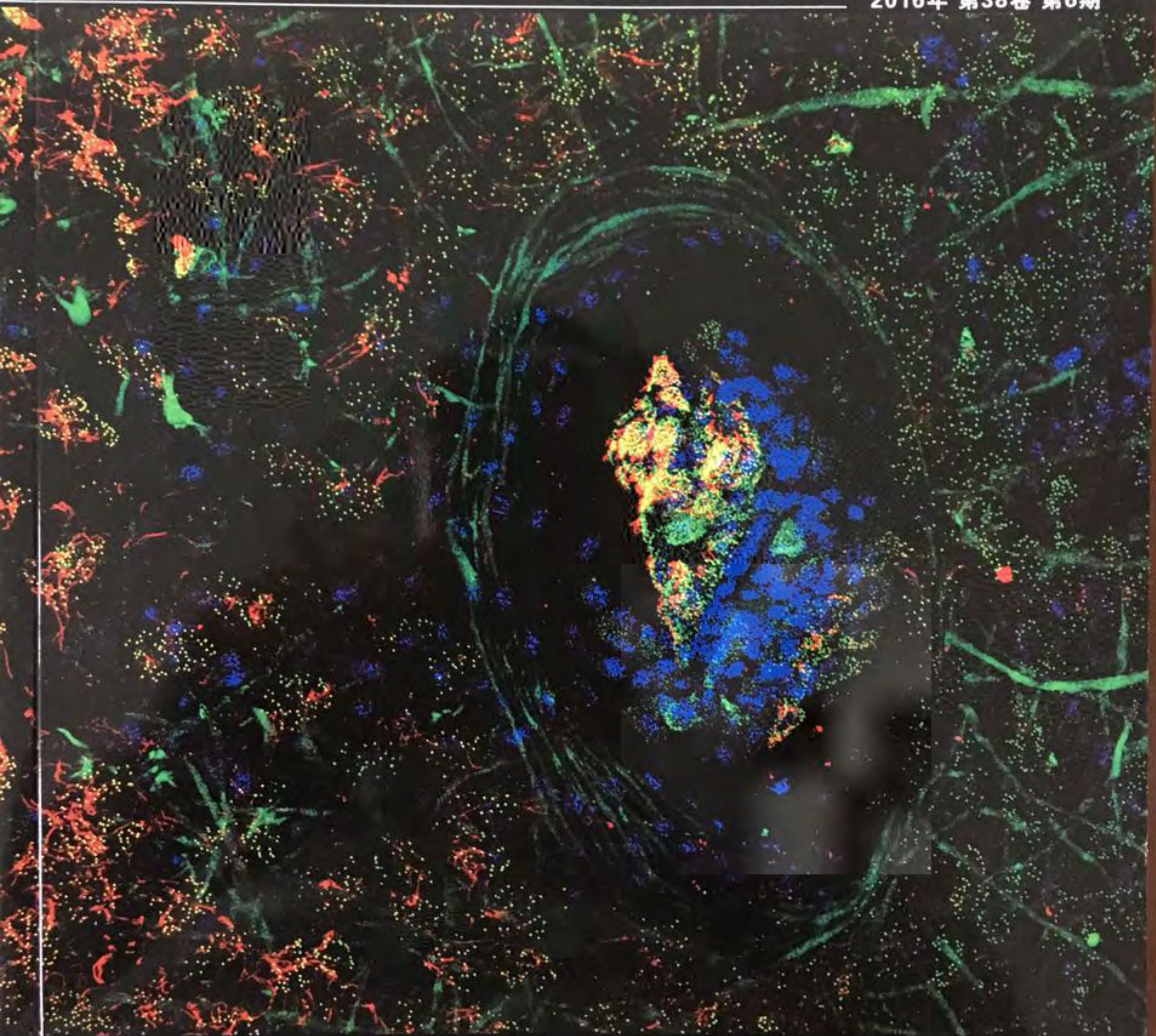
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中国细胞生物学学会



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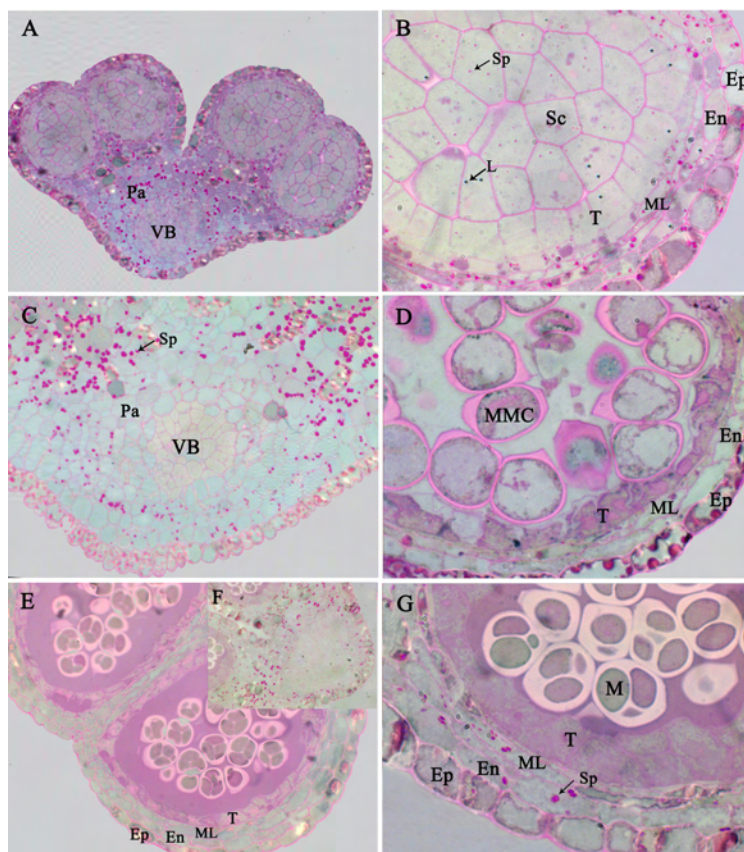
封面照片

在生命之花簇拥的暖巢里, 安静地睡着一只小小的雏鸟。样品取材自涡虫咽部, 是人工去除咽部以后再生长到56小时的咽部, 从咽孔里伸出来。“巢”周围的花朵和蜷缩的雏鸟, 红色的是纤毛, 绿色的是中心粒, 蓝色的是核, “巢”是咽孔的肌肉组织(作者: 李亚萍)。

3 , 0.5 h
 , Epon 812 Leica Ultra-
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 (Periodic Acid-Schiff stain, PAS)
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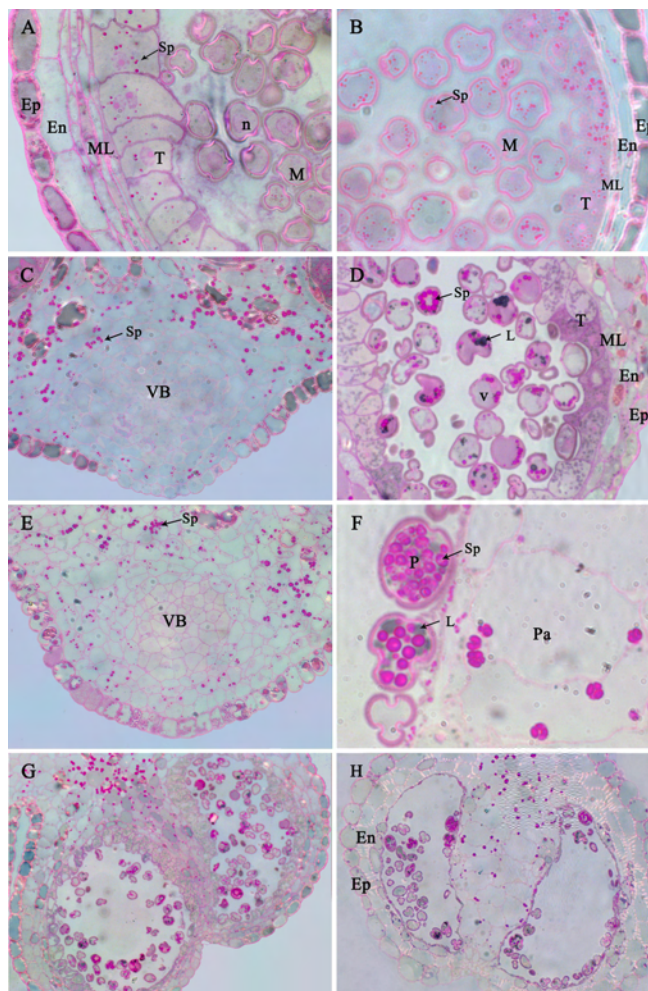
(1C) PAS (1E) ,
 (1D) (1F) ,
 2.1.3 (1G)



A: (Sc) , (VB) (Pa) (Sp) B: (Ep) (En) (ML) (T), C: (MMC) D: E: F: G: (M) PAS F: G: En: ; Ep: ; L: ; M: ; MMC: ; ML: ; Pa: ; Sc: ; Sp: ; T: ; VB: A: 200×; B D G: 1 000×; C E F: 400×

A: transverse section of an anther at the sporogenous cell stage of *Hypericum monogynum* L., with tetrasporangiate anthers. Lots of starch grains (stained red) are evident in parenchymal cells around vascular bundle. B: the anther wall is composed of epidermis, endothecium, middle layer, and tapetum cells. Some starch is visible in epidermis, endothecium, and middle layer cells. No starch and lipid droplet is in tapetal cells. Small starch grains and lipid droplets are visible in sporogenous cells. C: at MMC stage, vascular bundle cells are stained red. Abundant starch grains are accumulated in parenchymal cells. D: MMCs are wrapped in red callose walls. Little starch and lipid droplets are visible in MMCs. Large size starch grains are visible in epidermic cells. No starch and lipid droplet is in endothecium, middle layer, and tapetum cells. The morphology changes occur in tapetum cells. E: the tetrad stage is characterized by four microspores wrapped in red callose walls. The PAS-positive material is filled with pollen sac. F: starch grains are visible in parenchymal cells. G: no starch and lipid droplet is in microspores and epidermis. Little starch and lipid droplets are visible in endothecium and middle layer. The cytoplasm of tapetum cells is stained red. En: endothecium; Ep: epidermis; L: lipid droplet; M: microspore; MMC: microspore mother cell; ML: middle layer; Pa: parenchymal cell; Sc: sporogenous cell; T: tapetum; VB: vascular bundle. A: 200×; B, D, G: 1 000×; C, E, F: 400×.

Fig.1 Starch and lipid droplets distribution in young anthers of *Hypericum monogynum* L.



A: *Hypericum monogynum* L. anther at early microspore stage (M) (400 \times); B: *Hypericum monogynum* L. anther at early microspore stage (M) (400 \times); C: *Hypericum monogynum* L. anther at early microspore stage (M) (400 \times); D: *Hypericum monogynum* L. anther at late microspore stage (M) (400 \times); E: *Hypericum monogynum* L. anther at early microspore stage (M) (400 \times); F: *Hypericum monogynum* L. anther at mature pollen stage (P) (1000 \times); G: *Hypericum monogynum* L. anther at anthesis (200 \times); H: *Hypericum monogynum* L. anther at anthesis (200 \times). En: endothecium; Ep: epidermis; L: lipid droplet; M: microspore; ML: middle layer; n: nucleus; P: pollen; Pa: parenchymal cell; T: tapetum; VB: vascular bundle; v: vacuole. A-E: 400 \times ; F: 1000 \times ; G, H: 200 \times .

A: the free microspores are released from callose walls. No starch and lipid droplet is in early microspores. Epidemis and endothecium cells remain high vacuolization, and little starch is present in cytoplasm. The middle layer is comprised of 4-5 layers cells. Some starch is visible in tapetum cells. B: starch grains begin to accumulate in cytoplasm during microspores development. No changes occur in epidemis and endothecium cells. The middle layer is compressed into narrow cell zone. Starch grains increase significantly in tapetum cells. C: a lot of starch grains are accumulated in the cytoplasm of parenchymatous cells. Some cells are dyed black. D: in late microspore stage anthers, a large vacuole occupies almost the entire cellular volume. Large size starch and lipid droplets appear in the vacuolated microspore cytoplasm. The microspores begin to degenerate. The large size starch grains are visible in epidemis, endothecium and middle layer cells. Tapetum cells begin to degenerate, and lipid droplets are filled with cytoplasm. E: plenty of starch grains are accumulated in the parenchyma cells at this stage. F: mature pollens are filled with starch grains. Compound starch grains are present in parenchymal cells. G: during the early bicellular stage, most pollens abortion occurs at this stage. A few of pollens are filled with starch grains and lipid droplets. No noticeable changes occur in anther wall cells. Amount of starch grains accumulate in parenchymal cells. H: at anthesis, a few of pollens develop into mature pollens and are filled with nutritional substances. The anther wall consists of epidemis and endothecium cells. Tapetum and middle layer cells completely degenerate, and endothecium cells undergo radial and inner tangential wall thickening. En: endothecium; Ep: epidermis; L: lipid droplet; M: microspore; ML: middle layer; n: nucleus; P: pollen; Pa: parenchymal cell; T: tapetum; VB: vascular bundle; v: vacuole. A-E: 400 \times ; F: 1000 \times ; G, H: 200 \times .

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[26] [21]
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