

## Supplementary Information

### Morpho-Butterfly Inspired Optical Diffraction, Diffusion, and Bio-Chemicals Sensing

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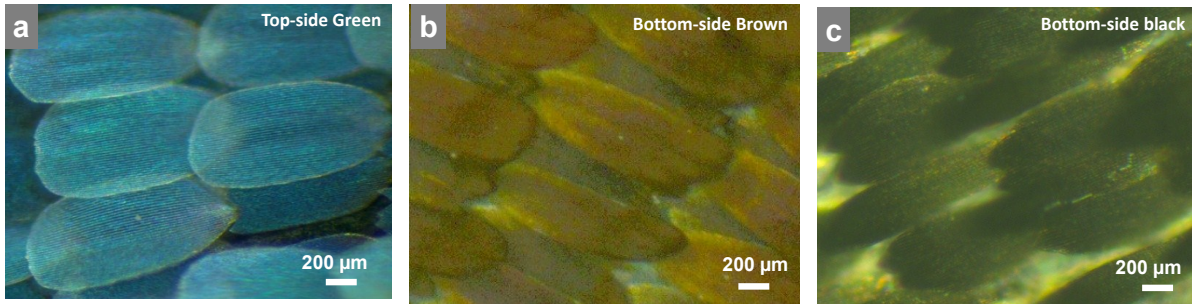
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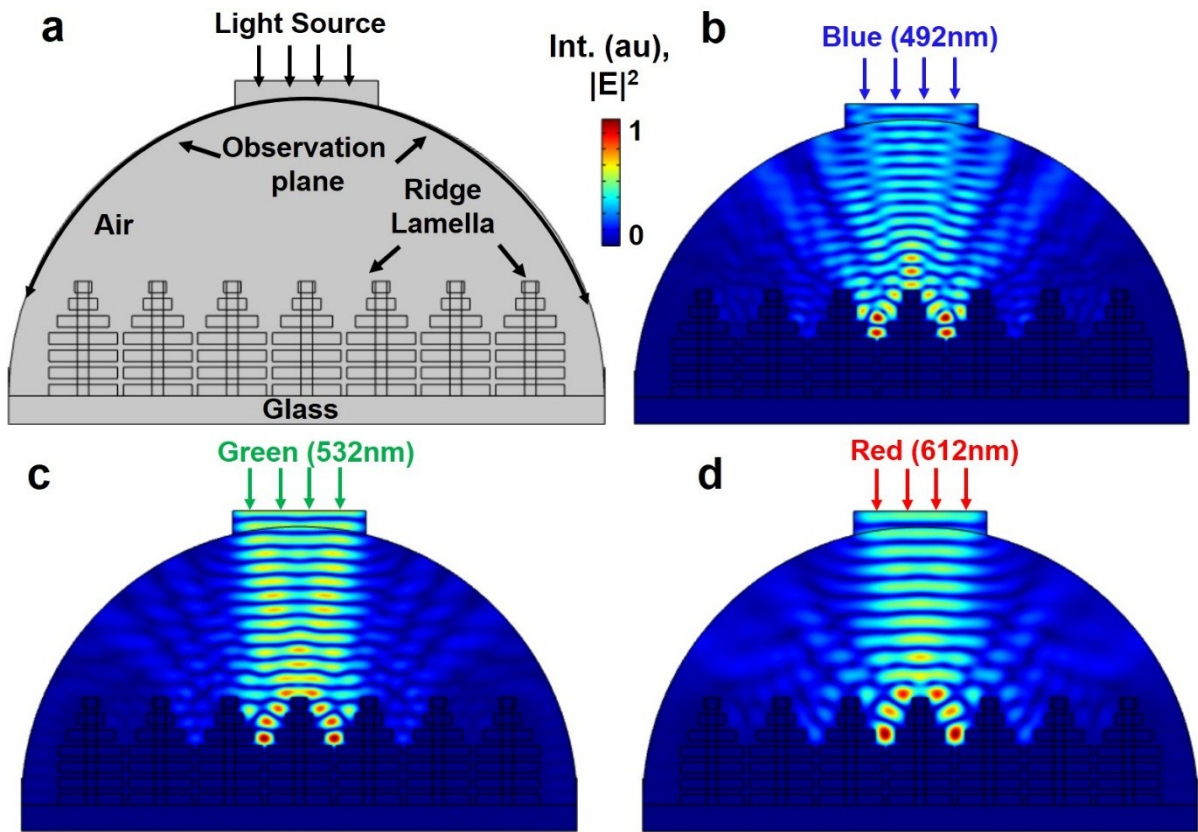
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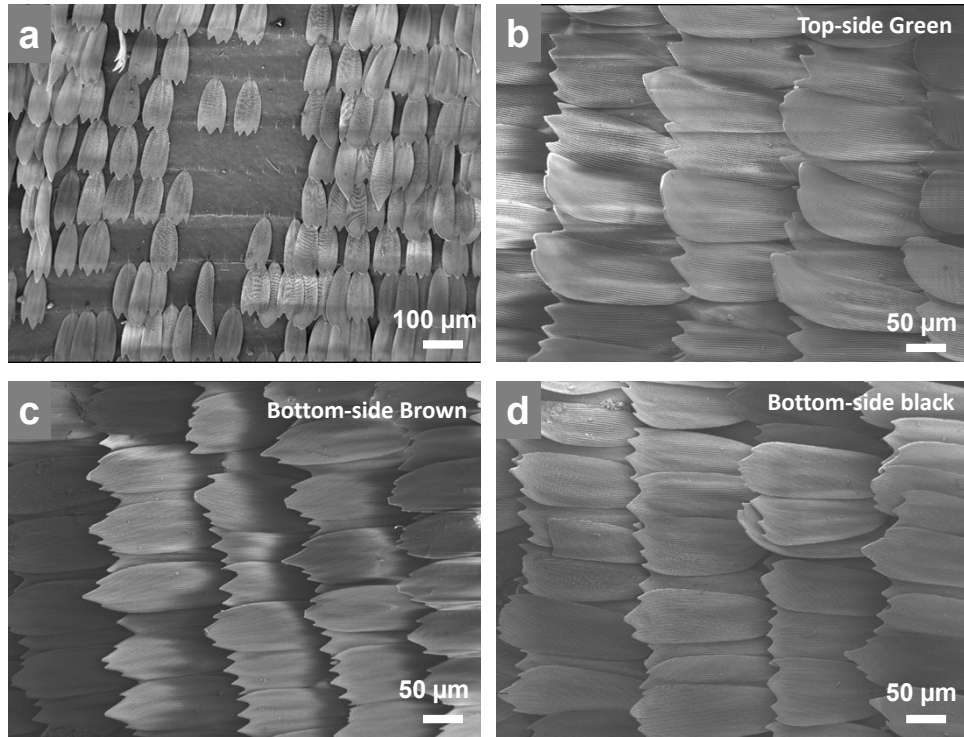
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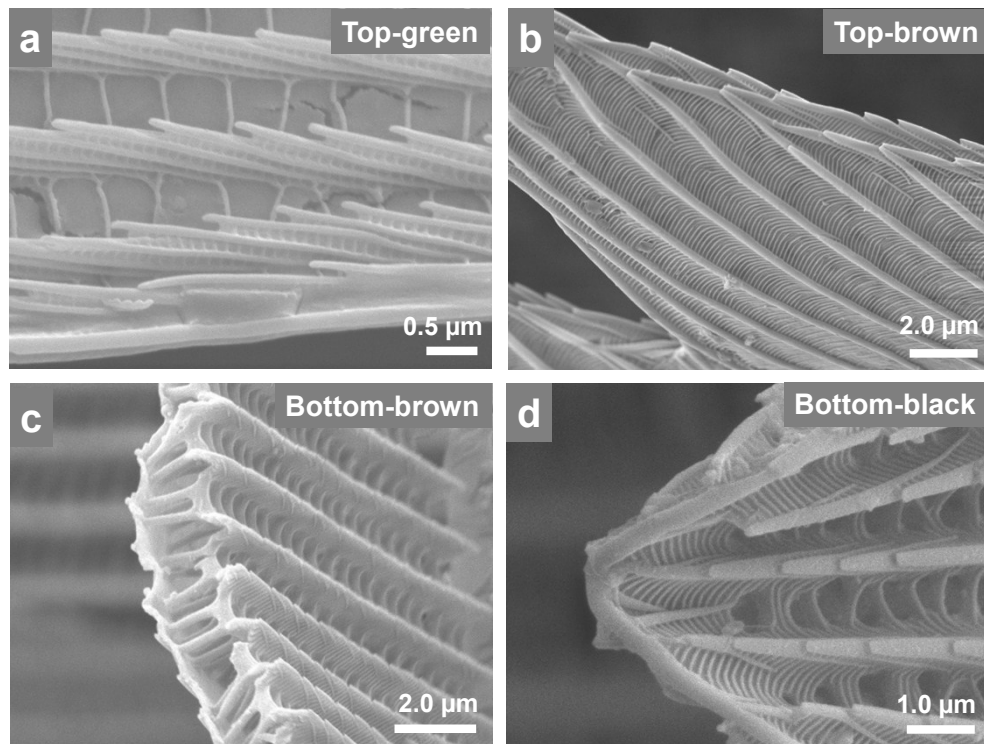
**Figure S1:** Magnified microscopic image of *Morpho*-butterfly wing scale. (a) Top-side green, (b,c) Bottom-side brown and black regions.



**Figure S2:** (a) Computational block diagram of normal reflection from ridge lamella structure. (b-d) Electric field's intensity distribution with violet, green, and red light normal illumination.



**Figure S3:** SEM image of *Morpho*-butterfly wing scale. (a) Layered structure, (b-d) Top-side green, (b,c) bottom-side brown and black regions.



**Figure S4:** (a-d) Top and bottom side-view SEM image of *Morpho*-butterfly wing scale.