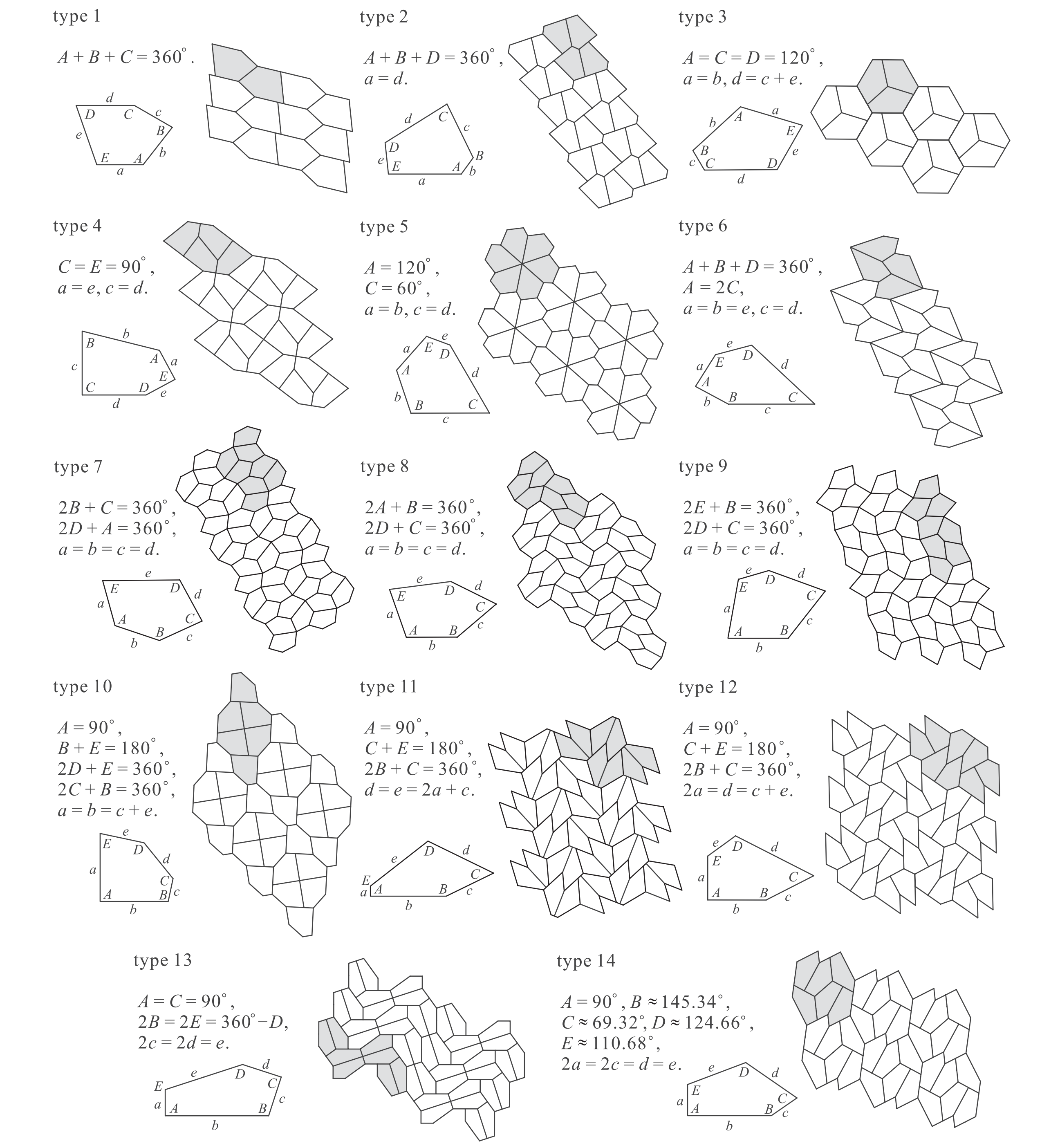

Fig. 1. Convex pentagonal tiles of 14 types. The pale gray pentagons in each tiling indicate the fundamental region (the unit that can generate a periodic tiling by translation only).

THEOREM 4 *Let T be an edge-to-edge tiling by a convex pentagonal tile. If T has only* 3*-valent nodes of size* 3 *and* 4*-valent nodes, then the convex pentagonal tile belongs to one (or more) of type* 1*, type* 2*, or type* 4*.*

The purpose of this paper is to introduce a plan to answer the following. Among the convex pentagons that can generate an edge-to-edge tilings, is there any one that does not belong to the known 14 types? Let us roughly explain our plan and procedure. Let $G = ABCDE$ be a candidate of convex pentagonal tile that can generate an edge-to-edge tiling. Then, by Bagina's Proposition, it has at least three vertices that will become 3-valent nodes in the tiling. We choose two of them, and consider conditions on angles, and edge lengths. By these conditions, we can produce 465 patterns of pentagons. Examine these pentagons one by one, and classify them into (i) geometrically impossible cases, (ii) the cases that cannot generate an edge-to-edge tiling, (iii) known types, and (iv) remainders. If there is no remainder, then the list of known types will be a perfect list,