Natural and semisynthetic polymers blended orodispersible films of citalopram

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This study was aimed at developing orodispersible films of citalopram using combination of natural and semisynthetic polymers for patients with swallowing problem. Okra biopolymer and moringa gum were utilized in combination with hydroxypropyl methylcellulose (HPMC) and pullulan. The disintegration time was less than 30 seconds and the drug content uniformity was 97.89 – 102.05% for all film formulations. Films formulated with HPMC (K15 and K4M) combination (F1) and combination of okra and HPMC K15 (F2) had superior mechanical properties as compared with F3 (okra and pullulan) and F4 (moringa gum and HPMC). Thermal analysis revealed stable formulations over the studied temperature range and the crystalline citalopram was completely or partially transformed into amorphous form as revealed by the differential thermal analysis, X-ray diffraction and scanning electron microscopy images. In conclusion, okra biopolymer could be used in combination with HPMC for the development of orodispersible films.

**Keywords:** citalopram; disintegration; okra biopolymer; orodispersible films; tensile strength
Table S1. Mechanical properties of film

| Formulations | Tensile strength (N/mm²) | Elongation (% E) | Young Modulus (N/mm²) | Folding endurance (n) |
|--------------|--------------------------|------------------|-----------------------|----------------------|
| F1           | 2.60 ± 0.13              | 44.1 ± 2.21      | 16.86 ± 0.84          | 220 ± 2.31           |
| F2           | 4.30 ± 0.22              | 13.5 ± 0.68      | 271.18 ± 13.56        | 222 ± 4.51           |
| F3           | 4.60 ± 0.26              | 2.30 ± 0.12      | 527.08 ± 26.35        | 240 ± 1.99           |
| F4           | 1.80 ± 0.09              | 8.28 ± 0.42      | 54.60 ± 2.73          | 230 ± 2.00           |
Figure S1: FTIR spectra of citalopram, okra biopolymer, moringa gum and ODFs
Figure S2: Thermogravimetric (A) and Differential thermal analysis (B) of citalopram loaded ODFs

Figure S3: X-ray patterns of citalopram loaded ODFs
Figure S4. SEM images of citalopram loaded ODFs

Figure S5: Calibration curve of citalopram HBr